

82936-7_seq_28_apr_2004_v1.ST25
SEQUENCE LISTING

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<120> SARS VIRUS NUCLEOTIDE AND AMINO ACID SEQUENCES AND USES THEREOF

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<160> 206

<170> PatentIn version 3.3

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<212> DNA

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 ggggaccaag acctaatacag acaaggaact gattacaaac attggccgca aattgcacaa 29040
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<210> 18
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 <223> n is a, c, g, or t

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 <213> Severe acute respiratory syndrome virus

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<213> Severe acute respiratory syndrome virus

<400> 23
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16

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<213> Severe acute respiratory syndrome virus

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<210> 25
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<213> Severe acute respiratory syndrome virus

<400> 25
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11

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<400> 26
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<400> 29
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15

<210> 30
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<213> Severe acute respiratory syndrome virus

<400> 30

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24

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<210> 32

<211> 178

<212> DNA

<213> Avian infectious bronchitis

<400> 32

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<210> 33

<211> 1255

<212> PRT

<213> Severe acute respiratory syndrome virus

<400> 33

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His Thr Ser Ser Met Arg Gly Val Tyr Tyr Pro Asp Glu Ile Phe Arg
35 40 45

Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser
50 55 60

Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Gly Asn Pro Val
65 70 75 80

Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn
85 90 95

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Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln
 100 105 110
 Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Cys
 115 120 125
 Asn Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met
 130 135 140
 Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr
 145 150 155 160
 Phe Glu Tyr Ile Ser Asp Ala Phe Ser Leu Asp Val Ser Glu Lys Ser
 165 170 175
 Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly
 180 185 190
 Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp
 195 200 205
 Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu
 210 215 220
 Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Ser Pro
 225 230 235 240
 Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr
 245 250 255
 Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile
 260 265 270
 Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys
 275 280 285
 Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn
 290 295 300
 Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe Pro Asn Ile Thr
 305 310 315 320
 Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser
 325 330 335
 Val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys Val Ala Asp Tyr
 340 345 350

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Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly
355 360 365

Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala
370 375 380

Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly
385 390 395 400

Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe
405 410 415

Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser
420 425 430

Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu
435 440 445

Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly
450 455 460

Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp
465 470 475 480

Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln Pro Tyr Arg Val
485 490 495

Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val Cys Gly
500 505 510

Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys Val Asn Phe Asn
515 520 525

Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro Ser Ser Lys Arg
530 535 540

Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser Asp Phe Thr Asp
545 550 555 560

Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp Ile Ser Pro Cys
565 570 575

Ala Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala Ser Ser
580 585 590

Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val Ser Thr
595 600 605

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Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Ile Tyr Ser Thr
610 615 620

Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly Ala Glu
625 630 635 640

His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile Gly Ala Gly Ile
645 650 655

Cys Ala Ser Tyr His Thr Val Ser Leu Leu Arg Ser Thr Ser Gln Lys
660 665 670

Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Asp Ser Ser Ile Ala
675 680 685

Tyr Ser Asn Asn Thr Ile Ala Ile Pro Thr Asn Phe Ser Ile Ser Ile
690 695 700

Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr Ser Val Asp Cys
705 710 715 720

Asn Met Tyr Ile Cys Gly Asp Ser Thr Glu Cys Ala Asn Leu Leu Leu
725 730 735

Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Ser Gly Ile
740 745 750

Ala Ala Glu Gln Asp Arg Asn Thr Arg Glu Val Phe Ala Gln Val Lys
755 760 765

Gln Met Tyr Lys Thr Pro Thr Leu Lys Tyr Phe Gly Gly Phe Asn Phe
770 775 780

Ser Gln Ile Leu Pro Asp Pro Leu Lys Pro Thr Lys Arg Ser Phe Ile
785 790 795 800

Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly Phe Met
805 810 815

Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Asn Ala Arg Asp Leu Ile
820 825 830

Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro Leu Leu Thr
835 840 845

Asp Asp Met Ile Ala Ala Tyr Thr Ala Ala Leu Val Ser Gly Thr Ala
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850

855

860

Thr Ala Gly Trp Thr Phe Gly Ala Gly Ala Ala Leu Gln Ile Pro Phe
 865 870 875 880

Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val Thr Gln Asn
 885 890 895

Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala
 900 905 910

Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly
 915 920 925

Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu
 930 935 940

Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn
 945 950 955 960

Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val Gln Ile Asp
 965 970 975

Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr Tyr Val Thr Gln
 980 985 990

Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala Asn Leu Ala Ala
 995 1000 1005

Thr Lys Met Ser Glu Cys Val Leu Gly Gln Ser Lys Arg Val Asp
 1010 1015 1020

Phe Cys Gly Lys Gly Tyr His Leu Met Ser Phe Pro Gln Ala Ala
 1025 1030 1035

Pro His Gly Val Val Phe Leu His Val Thr Tyr Val Pro Ser Gln
 1040 1045 1050

Glu Arg Asn Phe Thr Thr Ala Pro Ala Ile Cys His Glu Gly Lys
 1055 1060 1065

Ala Tyr Phe Pro Arg Glu Gly Val Phe Val Phe Asn Gly Thr Ser
 1070 1075 1080

Trp Phe Ile Thr Gln Arg Asn Phe Phe Ser Pro Gln Ile Ile Thr
 1085 1090 1095

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Thr Asp Asn Thr Phe Val Ser Gly Asn Cys Asp Val Val Ile Gly
1100 1105 1110

Ile Ile Asn Asn Thr Val Tyr Asp Pro Leu Gln Pro Glu Leu Asp
1115 1120 1125

Ser Phe Lys Glu Glu Leu Asp Lys Tyr Phe Lys Asn His Thr Ser
1130 1135 1140

Pro Asp Val Asp Leu Gly Asp Ile Ser Gly Ile Asn Ala Ser Val
1145 1150 1155

Val Asn Ile Gln Lys Glu Ile Asp Arg Leu Asn Glu Val Ala Lys
1160 1165 1170

Asn Leu Asn Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly Lys Tyr
1175 1180 1185

Glu Gln Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu Gly Phe Ile
1190 1195 1200

Ala Gly Leu Ile Ala Ile Val Met Val Thr Ile Leu Leu Cys Cys
1205 1210 1215

Met Thr Ser Cys Cys Ser Cys Leu Lys Gly Ala Cys Ser Cys Gly
1220 1225 1230

Ser Cys Cys Lys Phe Asp Glu Asp Asp Ser Glu Pro Val Leu Lys
1235 1240 1245

Gly Val Lys Leu His Tyr Thr
1250 1255

<210> 34
<211> 220
<212> PRT
<213> Severe acute respiratory syndrome virus
<400> 34

Met Ala Asp Asn Gly Thr Ile Thr Val Glu Glu Leu Lys Gln Leu Leu
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Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp Ile Met
20 25 30

Leu Leu Gln Phe Ala Tyr Ser Asn Arg Asn Arg Phe Leu Tyr Ile Ile
35 40 45

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Lys Leu Val Phe Leu Trp Leu Leu Trp Pro Val Thr Leu Ala Cys Phe
50 55 60

Val Leu Ala Ala Val Tyr Arg Ile Asn Trp Val Thr Gly Gly Ile Ala
65 70 75 80

Ile Ala Met Ala Cys Ile Val Gly Leu Met Trp Leu Ser Tyr Phe Val
85 90 95

Ala Ser Phe Arg Leu Phe Ala Arg Thr Arg Ser Met Trp Ser Phe Asn
100 105 110

Pro Glu Thr Asn Ile Leu Leu Asn Val Pro Leu Arg Gly Thr Ile Val
115 120 125

Thr Arg Pro Leu Met Glu Ser Glu Leu Val Ile Gly Ala Val Ile Ile
130 135 140

Arg Gly His Leu Arg Met Ala Gly His Ser Leu Gly Arg Cys Asp Ile
145 150 155 160

Lys Asp Leu Pro Lys Glu Ile Thr Val Ala Thr Ser Arg Thr Leu Ser
165 170 175

Tyr Tyr Lys Leu Gly Ala Ser Gln Arg Val Gly Thr Asp Ser Gly Phe
180 185 190

Ala Ala Tyr Asn Arg Tyr Arg Ile Gly Asn Tyr Lys Leu Asn Thr Asp
195 200 205

His Ala Gly Ser Asn Asp Asn Ile Ala Leu Leu Val
210 215 220

<210> 35
<211> 76
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 35

Met Tyr Ser Phe Val Ser Glu Glu Thr Gly Thr Leu Ile Val Asn Ser
1 5 10 15

Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
20 25 30

Ile Leu Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn
35 40 45

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Val Ser Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn
50 55 60

Leu Asn Ser Ser Glu Gly Val Pro Asp Leu Leu Val
65 70 75

<210> 36
<211> 422
<212> PRT
<213> Severe acute respiratory syndrome virus
<400> 36

Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro Arg Ile
1 5 10 15

Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn Gly Gly
20 25 30

Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu Pro Asn
35 40 45

Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu
50 55 60

Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn Ser Gly
65 70 75 80

Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg
85 90 95

Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr Phe Tyr
100 105 110

Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala Asn Lys
115 120 125

Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr Pro Lys
130 135 140

Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr Val Leu
145 150 155 160

Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala Glu Gly
165 170 175

Ser Arg Gly Gly Ser Gln Ala Ser Ser Arg Ser Ser Ser Arg Ser Arg
180 185 190

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Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn Ser Pro
 195 200 205

Ala Arg Met Ala Ser Gly Gly Gly Glu Thr Ala Leu Ala Leu Leu Leu
 210 215 220

Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln
 225 230 235 240

Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser
 245 250 255

Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr
 260 265 270

Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly
 275 280 285

Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln
 290 295 300

Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg
 305 310 315 320

Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly
 325 330 335

Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile
 340 345 350

Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu
 355 360 365

Pro Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro
 370 375 380

Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp
 385 390 395 400

Met Asp Asp Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly Ala Ser
 405 410 415

Ala Asp Ser Thr Gln Ala
 420

<210> 37
 <211> 230
 <212> PRT

<213> Bovine coronavirus

<400> 37

Met Ser Ser Val Thr Thr Pro Ala Pro Val Tyr Thr Trp Thr Ala Asp
 1 5 10 15

Glu Ala Ile Lys Phe Leu Lys Glu Trp Asn Phe Ser Leu Gly Ile Ile
 20 25 30

Leu Leu Phe Ile Thr Val Ile Leu Gln Phe Gly Tyr Thr Ser Arg Ser
 35 40 45

Met Phe Val Tyr Val Ile Lys Met Val Ile Leu Trp Leu Met Trp Pro
 50 55 60

Leu Thr Ile Ile Leu Thr Ile Phe Asn Cys Val Tyr Ala Leu Asn Asn
 65 70 75 80

Val Tyr Leu Gly Phe Ser Ile Val Phe Thr Ile Val Ala Ile Ile Met
 85 90 95

Trp Ile Val Tyr Phe Val Asn Ser Ile Arg Leu Phe Ile Arg Thr Gly
 100 105 110

Ser Trp Trp Ser Phe Asn Pro Glu Thr Asn Asn Leu Met Cys Ile Asp
 115 120 125

Met Lys Gly Arg Met Tyr Val Arg Pro Ile Ile Glu Asp Tyr His Thr
 130 135 140

Leu Thr Val Thr Ile Ile Arg Gly His Leu Tyr Met Gln Gly Ile Lys
 145 150 155 160

Leu Gly Thr Gly Tyr Ser Leu Ser Asp Leu Pro Ala Tyr Val Thr Val
 165 170 175

Ala Lys Val Ser His Leu Leu Thr Tyr Lys Arg Gly Phe Leu Asp Lys
 180 185 190

Ile Gly Asp Thr Ser Gly Phe Ala Val Tyr Val Lys Ser Lys Val Gly
 195 200 205

Asn Tyr Arg Leu Pro Ser Thr Gln Lys Gly Ser Gly Leu Asp Thr Ala
 210 215 220

Leu Leu Arg Asn Asn Ile
 225 230

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<210> 38
 <211> 226
 <212> PRT
 <213> Avian infectious bronchitis virus

<400> 38

Met Ser Asn Gly Thr Glu Asn Cys Thr Leu Ser Thr Gln Gln Ala Ala
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Glu Leu Phe Lys Glu Tyr Asn Leu Phe Ile Thr Ala Phe Leu Leu Phe
 20 25 30

Leu Thr Ile Leu Leu Gln Tyr Gly Tyr Ala Thr Arg Ser Arg Phe Ile
 35 40 45

Tyr Ile Leu Lys Met Ile Val Leu Trp Cys Phe Trp Pro Leu Asn Ile
 50 55 60

Ala Val Gly Ile Ile Ser Cys Ile Tyr Pro Pro Asn Thr Gly Gly Leu
 65 70 75 80

Val Ala Ala Ile Ile Leu Thr Val Phe Ala Cys Leu Ser Phe Val Gly
 85 90 95

Tyr Trp Ile Gln Ser Phe Arg Leu Phe Lys Arg Cys Arg Ser Trp Trp
 100 105 110

Ser Phe Asn Pro Glu Ser Asn Ala Val Gly Ser Ile Leu Leu Thr Asn
 115 120 125

Gly Gln Gln Cys Asn Phe Ala Ile Glu Ser Val Pro Met Val Leu Ser
 130 135 140

Pro Ile Ile Lys Asn Gly Ala Leu Tyr Cys Glu Gly Gln Trp Leu Ala
 145 150 155 160

Lys Cys Glu Pro Asp His Leu Pro Lys Asp Ile Phe Val Cys Thr Pro
 165 170 175

Asp Arg Arg Asn Ile Tyr Arg Met Val Gln Lys Tyr Thr Gly Asp Gln
 180 185 190

Ser Gly Asn Lys Lys Arg Phe Ala Thr Phe Val Tyr Ala Lys Gln Ser
 195 200 205

Val Asp Thr Gly Glu Leu Gly Ser Val Ala Thr Gly Gly Ser Ser Leu
 210 215 220

Tyr Thr
225

<210> 39
<211> 262
<212> PRT
<213> Transmissible gastroenteritis virus

<400> 39

Met Lys Ile Leu Leu Ile Leu Ala Cys Val Ile Ala Cys Ala Cys Gly
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Glu Arg Tyr Cys Ala Met Lys Ser Asp Thr Asp Leu Ser Cys Arg Asn
20 25 30

Ser Thr Ala Ser Asp Cys Glu Ser Cys Phe Asn Gly Gly Asp Leu Ile
35 40 45

Trp His Leu Ala Asn Trp Asn Phe Ser Trp Ser Ile Ile Leu Ile Val
50 55 60

Phe Ile Thr Val Leu Gln Tyr Gly Arg Pro Gln Phe Ser Trp Phe Val
65 70 75 80

Tyr Gly Ile Lys Met Leu Ile Met Trp Leu Leu Trp Pro Val Val Leu
85 90 95

Ala Leu Thr Ile Phe Asn Ala Tyr Ser Glu Tyr Gln Val Ser Arg Tyr
100 105 110

Val Met Phe Gly Phe Ser Ile Ala Gly Ala Ile Val Thr Phe Val Leu
115 120 125

Trp Ile Met Tyr Phe Val Arg Ser Ile Gln Leu Tyr Arg Arg Thr Lys
130 135 140

Ser Trp Trp Ser Phe Asn Pro Glu Thr Lys Ala Ile Leu Cys Val Ser
145 150 155 160

Ala Leu Gly Arg Ser Tyr Val Leu Pro Leu Glu Gly Val Pro Thr Gly
165 170 175

Val Thr Leu Thr Leu Leu Ser Gly Asn Leu Tyr Ala Glu Gly Phe Lys
180 185 190

Ile Ala Gly Gly Met Asn Ile Asp Asn Leu Pro Lys Tyr Val Met Val
195 200 205

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Ala Leu Pro Ser Arg Thr Ile Val Tyr Thr Leu Val Gly Lys Lys Leu
210 215 220

Lys Ala Ser Ser Ala Thr Gly Trp Ala Tyr Tyr Val Lys Ser Lys Ala
225 230 235 240

Gly Asp Tyr Ser Thr Glu Ala Arg Thr Asp Asn Leu Ser Glu Gln Glu
245 250 255

Lys Leu Leu His Met Val
260

<210> 40
<211> 263
<212> PRT
<213> feline coronavirus

<400> 40

Met Lys Ile Leu Leu Ile Leu Ala Cys Ala Val Ala Cys Val Tyr Gly
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Glu Gln Ile Arg Tyr Cys Ala Met Gln Glu Thr Gly Leu Ser Cys Arg
20 25 30

Asn Gly Thr Ala Ser Asp Cys Glu Ser Cys Phe Asn Gly Gly Asp Leu
35 40 45

Ile Trp His Leu Ala Asn Trp Asn Phe Ser Trp Ser Ile Ile Leu Ile
50 55 60

Val Phe Ile Thr Val Leu Gln Tyr Gly Arg Pro Gln Phe Ser Trp Phe
65 70 75 80

Val Tyr Gly Ile Lys Met Leu Ile Met Trp Leu Leu Trp Pro Ile Val
85 90 95

Leu Ala Leu Thr Ile Phe Asn Ala Tyr Ser Glu Tyr Glu Val Ser Arg
100 105 110

Tyr Val Met Phe Gly Phe Ser Val Ala Gly Ala Val Val Thr Phe Ala
115 120 125

Leu Trp Met Met Tyr Phe Val Arg Ser Ile Gln Leu Tyr Arg Arg Thr
130 135 140

Lys Ser Trp Trp Ser Phe Asn Pro Glu Thr Asn Ala Ile Leu Cys Val
145 150 155 160

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Asn Ala Leu Gly Arg Ser Tyr Val Leu Pro Leu Asp Gly Thr Pro Thr
165 170 175

Gly Val Thr Leu Thr Leu Leu Ser Gly Asn Leu Tyr Ala Glu Gly Phe
180 185 190

Lys Met Ala Gly Gly Leu Thr Ile Glu His Leu Pro Lys Tyr Val Met
195 200 205

Ile Arg Thr Pro Asn Arg Thr Ile Val Tyr Thr Leu Val Gly Lys Gln
210 215 220

Leu Lys Ala Thr Thr Ala Thr Gly Trp Ala Tyr Tyr Val Lys Ser Lys
225 230 235 240

Ala Gly Asp Tyr Ser Thr Glu Ala Arg Thr Asp Asn Leu Ser Glu His
245 250 255

Glu Lys Leu Leu His Met Val
260

<210> 41

<211> 231

<212> PRT

<213> Human coronavirus OC43

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LSIVFTIVAIIMWIVYFVNSIRLFIRTGSFWSFNPETNNLMCIDMKGTMYVRPIIEDYHTLTVTIIRGHLYIQGIKLTGYSWA
DLPAYMTVAKVTHLCTYKRGFLDRISDTSGFAVYVKSKVGNRYRLPSTQKSGMDTALLRNNI

<SEQ ID NO:37;prt;Porcine hemagglutinating encephalomyelitis virus

<400> 41

Met Ser Ser Pro Thr Thr Pro Val Pro Val Ile Ser Trp Thr Ala Asp
1 5 10 15

Glu Ala Ile Lys Phe Leu Lys Glu Trp Asn Phe Ser Leu Gly Ile Ile
20 25 30

Val Leu Phe Ile Thr Ile Ile Leu Gln Phe Gly Tyr Thr Ser Arg Ser
35 40 45

Met Phe Val Tyr Val Ile Lys Met Val Ile Leu Trp Leu Met Trp Pro
50 55 60

Leu Thr Ile Ile Leu Thr Ile Phe Asn Cys Val Tyr Ala Leu Asn Asn
65 70 75 80

Val Tyr Leu Gly Phe Ser Ile Val Phe Thr Ile Val Ala Ile Ile Met
85 90 95

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Trp Val Val Tyr Phe Val Asn Ser Ile Arg Leu Phe Ile Arg Thr Gly
100 105 110

Ser Trp Trp Ser Phe Asn Pro Glu Thr Asn Asn Leu Met Cys Ile Asp
115 120 125

Met Lys Gly Arg Met Tyr Val Arg Pro Ile Ile Glu Asp Tyr His Thr
130 135 140

Leu Thr Ala Thr Ile Ile Arg Gly His Leu Tyr Ile Gln Gly Ile Lys
145 150 155 160

Leu Gly Thr Gly Tyr Ser Leu Ser Asp Leu Pro Ala Tyr Val Thr Val
165 170 175

Ala Lys Val Thr His Leu Cys Thr Tyr Lys Arg Gly Phe Leu Asp Arg
180 185 190

Ile Gly Asp Thr Ser Gly Phe Ala Val Tyr Val Lys Ser Lys Val Gly
195 200 205

Asn Tyr Arg Leu Pro Ser Thr His Lys Gly Ser Gly Met Asp Thr Ala
210 215 220

Leu Leu Arg Asn Asn Ile Met
225 230

<210> 42
<211> 223
<212> PRT
<213> Avian infectious bronchitis virus

<400> 42

Met Met Glu Asn Cys Thr Leu Asn Leu Glu Gln Ala Thr Leu Leu Phe
1 5 10 15

Lys Glu Tyr Asn Leu Phe Ile Thr Ala Phe Leu Leu Phe Leu Thr Ile
20 25 30

Leu Leu Gln Tyr Gly Tyr Ala Thr Arg Ser Arg Phe Ile Tyr Ile Leu
35 40 45

Lys Met Ile Val Leu Trp Cys Phe Trp Pro Leu Asn Ile Ala Val Gly
50 55 60

Val Ile Ser Cys Ile Tyr Pro Pro Asn Thr Gly Gly Leu Val Ala Ala
65 70 75 80

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Ile Ile Leu Thr Val Phe Ala Cys Leu Ser Phe Val Gly Tyr Trp Ile
85 90 95

Gln Ser Cys Arg Leu Phe Lys Arg Cys Arg Ser Trp Trp Ser Phe Asn
100 105 110

Pro Glu Ser Asn Ala Val Gly Ser Ile Leu Leu Thr Asn Gly Gln Gln
115 120 125

Cys Asn Phe Ala Ile Glu Ser Val Pro Met Val Leu Ala Pro Ile Ile
130 135 140

Lys Asn Gly Val Leu Tyr Cys Glu Gly Gln Trp Leu Ala Lys Cys Glu
145 150 155 160

Pro Asp His Leu Pro Lys Asp Ile Phe Val Cys Thr Pro Asp Arg Arg
165 170 175

Asn Ile Tyr Arg Met Val Gln Lys Tyr Thr Gly Asp Gln Ser Gly Asn
180 185 190

Lys Lys Arg Val Ala Thr Phe Val Tyr Ala Lys Gln Ser Val Asp Thr
195 200 205

Gly Glu Leu Glu Ser Val Pro Thr Gly Gly Ser Ser Leu Tyr Thr
210 215 220

<210> 43
<211> 455
<212> PRT
<213> Mouse Hepatitis Virus

<400> 43

Met Ser Phe Val Pro Gly Gln Glu Asn Ala Gly Ser Arg Ser Ser Ser
1 5 10 15

Val Asn Arg Ala Gly Asn Gly Ile Leu Lys Lys Thr Thr Trp Ala Asp
20 25 30

Gln Thr Glu Arg Gly Pro Asn Asn Gln Asn Arg Gly Arg Arg Asn Gln
35 40 45

Pro Lys Gln Thr Ala Thr Thr Gln Pro Asn Ser Gly Ser Val Val Pro
50 55 60

His Tyr Ser Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu
65 70 75 80

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Phe Gln Phe Ala Gln Gly Gln Gly Val Pro Ile Ala Asn Gly Ile Pro
85 90 95

Ala Ser Glu Gln Lys Gly Tyr Trp Tyr Arg His Asn Arg Arg Ser Phe
100 105 110

Lys Thr Pro Asp Gly Gln Gln Lys Gln Leu Leu Pro Arg Trp Tyr Phe
115 120 125

Tyr Tyr Leu Gly Thr Gly Pro His Ala Gly Ala Glu Tyr Gly Asp Asp
130 135 140

Ile Asp Gly Val Val Trp Val Ala Ser Gln Gln Ala Asp Thr Lys Thr
145 150 155 160

Thr Ala Asp Ile Val Glu Arg Asp Pro Ser Ser His Glu Ala Ile Pro
165 170 175

Thr Arg Phe Ala Pro Gly Thr Val Leu Pro Gln Gly Phe Tyr Val Glu
180 185 190

Gly Ser Gly Arg Ser Ala Pro Ala Ser Arg Ser Gly Ser Arg Ser Gln
195 200 205

Ser Arg Gly Pro Asn Asn Arg Ala Arg Ser Ser Ser Asn Gln Arg Gln
210 215 220

Pro Ala Ser Thr Val Lys Pro Asp Met Ala Glu Glu Ile Ala Ala Leu
225 230 235 240

Val Leu Ala Lys Leu Gly Lys Asp Ala Gly Gln Pro Lys Gln Val Thr
245 250 255

Lys Gln Ser Ala Lys Glu Val Arg Gln Lys Ile Leu Asn Lys Pro Arg
260 265 270

Gln Lys Arg Thr Pro Asn Lys Gln Cys Pro Val Gln Gln Cys Phe Gly
275 280 285

Lys Arg Gly Pro Asn Gln Asn Phe Gly Gly Ser Glu Met Leu Lys Leu
290 295 300

Gly Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr
305 310 315 320

Pro Ser Ala Phe Phe Phe Gly Ser Lys Leu Glu Leu Val Lys Lys Asn
Page 69

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330

335

Ser Gly Gly Ala Asp Asp Pro Thr Lys Asp Val Tyr Glu Leu Gln Tyr
 340 345 350

Ser Gly Ala Ile Arg Phe Asp Ser Thr Leu Pro Gly Phe Glu Thr Ile
 355 360 365

Met Lys Val Leu Asn Glu Asn Leu Asp Ala Tyr Gln Asp Gln Ala Gly
 370 375 380

Gly Ala Asp Val Val Ser Pro Lys Pro Gln Arg Lys Arg Gly Thr Lys
 385 390 395 400

Gln Lys Ala Leu Lys Gly Glu Val Asp Asn Val Ser Val Ala Lys Pro
 405 410 415

Lys Ser Ser Val Gln Arg Asn Val Ser Arg Glu Leu Thr Pro Glu Asp
 420 425 430

Arg Ser Leu Leu Ala Gln Ile Leu Asp Asp Gly Val Val Pro Asp Gly
 435 440 445

Leu Glu Asp Asp Ser Asn Val
 450 455

<210> 44
 <211> 448
 <212> PRT
 <213> Bovine coronavirus

<400> 44

Met Ser Phe Thr Pro Gly Lys Gln Ser Ser Ser Arg Ala Ser Ser Gly
 1 5 10 15

Asn Arg Ser Gly Asn Gly Ile Leu Lys Trp Ala Asp Gln Ser Asp Gln
 20 25 30

Ser Arg Asn Val Gln Thr Arg Gly Arg Arg Ala Gln Pro Lys Gln Thr
 35 40 45

Ala Thr Ser Gln Gln Pro Ser Gly Gly Asn Val Val Pro Tyr Tyr Ser
 50 55 60

Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu Phe Glu Phe
 65 70 75 80

Ala Glu Gly Gln Gly Val Pro Ile Ala Pro Gly Val Pro Ala Thr Glu
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Ala Lys Gly Tyr Trp Tyr Arg His Asn Arg Arg Ser Phe Lys Thr Ala
100 105 110

Asp Gly Asn Gln Arg Gln Leu Leu Pro Arg Trp Tyr Phe Tyr Tyr Leu
115 120 125

Gly Thr Gly Pro His Ala Lys Asp Gln Tyr Gly Thr Asp Ile Asp Gly
130 135 140

Val Tyr Trp Val Ala Ser Asn Gln Ala Asp Val Asn Thr Pro Ala Asp
145 150 155 160

Ile Leu Asp Arg Asp Pro Ser Ser Asp Glu Ala Ile Pro Thr Arg Phe
165 170 175

Pro Pro Gly Thr Val Leu Pro Gln Gly Tyr Tyr Ile Glu Gly Ser Gly
180 185 190

Arg Ser Ala Pro Asn Ser Arg Ser Thr Ser Arg Ala Ser Ser Arg Ala
195 200 205

Ser Ser Ala Gly Ser Arg Ser Arg Ala Asn Ser Gly Asn Arg Thr Pro
210 215 220

Thr Ser Gly Val Thr Pro Asp Met Ala Asp Gln Ile Ala Ser Leu Val
225 230 235 240

Leu Ala Lys Leu Gly Lys Asp Ala Ala Lys Pro Gln Gln Val Thr Lys
245 250 255

Gln Thr Ala Lys Glu Ile Arg Gln Lys Ile Leu Asn Lys Pro Arg Gln
260 265 270

Lys Arg Ser Pro Asn Lys Gln Cys Thr Val Gln Gln Cys Phe Gly Lys
275 280 285

Arg Gly Pro Asn Gln Asn Phe Gly Gly Gly Glu Met Leu Lys Leu Gly
290 295 300

Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr Ala
305 310 315 320

Gly Ala Phe Phe Phe Gly Ser Arg Leu Glu Leu Ala Lys Val Gln Asn
325 330 335

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Leu Ser Gly Asn Leu Asp Glu Pro Gln Lys Asp Val Tyr Glu Leu Arg
340 345 350

Tyr Asn Gly Ala Ile Arg Phe Asp Ser Thr Leu Ser Gly Phe Glu Thr
355 360 365

Ile Met Lys Val Leu Asn Glu Asn Leu Asn Ala Tyr Gln Gln Gln Asp
370 375 380

Gly Thr Met Asn Met Ser Pro Lys Pro Gln Arg Gln Arg Gly Gln Lys
385 390 395 400

Asn Gly Gln Gly Glu Asn Asp Asn Ile Ser Val Ala Ala Pro Lys Ser
405 410 415

Arg Val Gln Gln Asn Lys Ile Arg Glu Leu Thr Ala Glu Asp Ile Ser
420 425 430

Leu Leu Lys Lys Met Asp Glu Pro Phe Thr Glu Asp Thr Ser Glu Ile
435 440 445

<210> 45
<211> 409
<212> PRT
<213> Avian infectious bronchitis virus

<400> 45

Met Ala Ser Gly Lys Ala Ala Gly Lys Thr Asp Ala Pro Ala Pro Val
1 5 10 15

Ile Lys Leu Gly Gly Pro Lys Pro Pro Lys Val Gly Ser Ser Gly Asn
20 25 30

Ala Ser Trp Phe Gln Ala Leu Lys Ala Lys Lys Leu Asn Ala Pro Ala
35 40 45

Pro Lys Phe Glu Gly Ser Gly Val Pro Asp Asn Glu Asn Leu Lys Ile
50 55 60

Ser Gln Gln His Gly Tyr Trp Arg Arg Gln Ala Arg Tyr Lys Pro Gly
65 70 75 80

Lys Gly Gly Arg Lys Pro Val Pro Asp Ala Trp Tyr Phe Tyr Tyr Thr
85 90 95

Gly Thr Gly Pro Ala Ala Asp Leu Asn Trp Gly Asp Ser Gln Asp Gly
100 105 110

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Ile Val Trp Val Ala Ala Lys Gly Ala Asp Val Lys Ser Arg Ser Asn
 115 120 125

Gln Gly Thr Arg Asp Pro Asp Lys Phe Asp Gln Tyr Pro Leu Arg Phe
 130 135 140

Ser Asp Gly Gly Pro Asp Gly Asn Phe Arg Trp Asp Phe Ile Pro Leu
 145 150 155 160

Asn Arg Gly Arg Ser Gly Arg Ser Thr Ala Ala Ser Ser Ala Ala Ser
 165 170 175

Ser Arg Ala Pro Ser Arg Glu Gly Ser Arg Gly Arg Leu Asn Gly Ala
 180 185 190

Glu Asp Asp Leu Ile Ala Arg Ala Ala Lys Ile Ile Gln Asp Gln Gln
 195 200 205

Lys Lys Gly Ser Arg Ile Thr Lys Ala Lys Ala Glu Glu Met Ile His
 210 215 220

Arg Arg Tyr Cys Lys Arg Thr Val Pro Pro Gly Val Ser Ile Asp Lys
 225 230 235 240

Val Phe Gly Pro Arg Thr Lys Gly Lys Glu Gly Asn Phe Gly Asp Asp
 245 250 255

Lys Met Asn Glu Glu Gly Ile Lys Asp Gly Arg Val Thr Ala Met Leu
 260 265 270

Asn Leu Val Pro Ser Ser His Ala Cys Leu Phe Gly Ser Gln Val Thr
 275 280 285

Pro Lys Leu Gln Pro Asp Gly Leu His Leu Thr Phe Arg Phe Thr Thr
 290 295 300

Val Val Ser Arg Asp Asp Pro Gln Phe Asp Asn Tyr Val Lys Ile Cys
 305 310 315 320

Asp Glu Cys Val Asp Gly Val Gly Thr Arg Pro Lys Asp Glu Val Val
 325 330 335

Arg Pro Lys Ser Arg Ser Ser Ser Arg Pro Ala Thr Arg Gly Thr Ser
 340 345 350

Pro Ala Pro Lys Gln Gln Arg Pro Lys Lys Glu Lys Lys Pro Lys Lys
 355 360 365

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Gln Asp Asp Glu Val Asp Lys Ala Leu Thr Ser Asp Glu Glu Arg Asn
370 375 380

Asn Ala Gln Leu Glu Phe Asp Asp Glu Pro Lys Val Ile Asn Trp Gly
385 390 395 400

Asp Ser Ala Leu Gly Glu Asn Glu Leu
405

<210> 46
<211> 376
<212> PRT
<213> Feline coronavirus

<400> 46

Met Ala Thr Gln Gly Gln Arg Val Asn Trp Gly Asp Glu Pro Ser Lys
1 5 10 15

Arg Arg Gly Arg Ser Asn Ser Arg Gly Arg Lys Asn Asn Asp Ile Pro
20 25 30

Leu Ser Tyr Phe Asn Pro Ile Thr Leu Asp Gln Gly Ser Lys Phe Trp
35 40 45

Asn Leu Cys Pro Arg Asp Phe Val Pro Lys Gly Ile Gly Asn Lys Asp
50 55 60

Gln Gln Ile Gly Tyr Trp Asn Arg Gln Ala Arg Tyr Arg Ile Val Lys
65 70 75 80

Gly Gln Arg Val Glu Leu Pro Glu Arg Trp Phe Phe Tyr Phe Leu Gly
85 90 95

Thr Gly Pro His Ala Asp Ala Lys Phe Lys Ala Lys Ile Asp Gly Val
100 105 110

Phe Trp Val Ala Arg Asp Gly Ala Met Asn Lys Pro Thr Ser Leu Gly
115 120 125

Thr Arg Gly Thr Asn Asn Glu Ser Lys Pro Leu Lys Phe Asp Gly Lys
130 135 140

Ile Pro Pro Gln Phe Gln Leu Glu Val Asn Arg Ser Arg Asn Asn Ser
145 150 155 160

Arg Ser Gly Ser Gln Ser Arg Ser Val Ser Arg Asn Arg Ser Gln Ser
165 170 175

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Arg Gly Arg Gln Gln Ser Asn Asn Gln Asn Thr Asn Val Glu Asp Thr
180 185 190

Ile Val Ala Val Leu Gln Lys Leu Gly Val Thr Asp Lys Gln Arg Ser
195 200 205

Arg Ser Lys Ser Gly Glu Arg Ser Gln Ser Lys Ser Arg Asp Thr Thr
210 215 220

Pro Lys Asn Ala Asn Lys His Thr Trp Lys Lys Thr Ala Gly Lys Gly
225 230 235 240

Asp Val Thr Asn Phe Tyr Gly Ala Arg Ser Ser Ser Ala Asn Phe Gly
245 250 255

Asp Ser Asp Leu Val Ala Asn Gly Asn Ala Ala Lys Cys Tyr Pro Gln
260 265 270

Ile Ala Glu Cys Val Pro Ser Val Ser Ser Ile Leu Phe Gly Ser Gln
275 280 285

Trp Ser Ala Glu Glu Ala Gly Asp Gln Val Lys Val Thr Leu Thr His
290 295 300

Asn Tyr Tyr Leu Pro Lys Asp Asp Ala Lys Thr Ser Gln Phe Leu Glu
305 310 315 320

Gln Ile Asp Ala Tyr Lys Arg Pro Ser Glu Val Ala Lys Asp Gln Arg
325 330 335

Gln Arg Lys Ser Arg Ser Lys Ser Ala Asp Lys Lys Pro Glu Glu Leu
340 345 350

Ser Val Thr Leu Glu Ala Tyr Thr Asp Val Phe Asp Asp Thr Gln Val
355 360 365

Glu Met Ile Asp Glu Val Thr Asn
370 375

<210> 47
<211> 382
<212> PRT
<213> porcine transmissible gastroenteritis virus

<400> 47

Met Ala Asn Gln Gly Gln Arg Val Ser Trp Gly Asp Glu Ser Thr Lys
1 5 10 15

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Thr Arg Gly Arg Ser Asn Ser Arg Gly Arg Lys Asn Asn Asn Ile Pro
20 25 30

Leu Ser Phe Phe Asn Pro Ile Thr Leu Gln Gln Gly Ser Lys Phe Trp
35 40 45

Asn Leu Cys Pro Arg Asp Phe Val Pro Lys Gly Ile Gly Asn Arg Asp
50 55 60

Gln Gln Ile Gly Tyr Trp Asn Arg Gln Thr Arg Tyr Arg Met Val Lys
65 70 75 80

Gly Gln Arg Lys Glu Leu Pro Glu Arg Trp Phe Phe Tyr Tyr Leu Gly
85 90 95

Thr Gly Pro His Ala Asp Ala Lys Phe Lys Asp Lys Leu Asp Gly Val
100 105 110

Val Trp Val Ala Lys Asp Gly Ala Met Asn Lys Pro Thr Thr Leu Gly
115 120 125

Ser Arg Gly Ala Asn Asn Glu Ser Lys Ala Leu Lys Phe Asp Gly Lys
130 135 140

Val Pro Gly Glu Phe Gln Leu Glu Val Asn Gln Ser Arg Asp Asn Ser
145 150 155 160

Arg Leu Arg Ser Gln Ser Arg Ser Arg Ser Arg Asn Arg Ser Gln Ser
165 170 175

Arg Gly Arg Gln Gln Ser Asn Asn Lys Lys Asp Asp Ser Val Glu Gln
180 185 190

Ala Val Leu Ala Ala Leu Lys Lys Leu Gly Val Tyr Thr Glu Lys Gln
195 200 205

Gln Gln Arg Ser Arg Ser Lys Ser Lys Glu Arg Ser Asn Ser Lys Ile
210 215 220

Arg Asp Thr Thr Pro Lys Asn Glu Asn Lys His Thr Trp Lys Arg Thr
225 230 235 240

Ala Gly Lys Gly Asp Val Thr Arg Phe Tyr Gly Thr Arg Ser Asn Ser
245 250 255

Ala Asn Phe Gly Asp Ser Asp Leu Val Ala Asn Gly Ser Ser Ala Lys
260 265 270

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His Tyr Pro Gln Leu Ala Glu Cys Val Pro Ser Val Ser Ser Ile Leu
275 280 285

Phe Gly Ser Tyr Trp Thr Ser Lys Glu Asp Gly Asp Gln Ile Glu Val
290 295 300

Thr Phe Thr His Lys Tyr His Leu Pro Lys Asp Asp Pro Lys Thr Gly
305 310 315 320

Gln Phe Leu Gln Gln Ile Asn Ala Tyr Ala Arg Pro Ser Glu Val Ala
325 330 335

Lys Glu Gln Arg Lys Arg Lys Ser Arg Ser Lys Ser Ala Glu Arg Ser
340 345 350

Glu Gln Glu Val Val Pro Asp Ala Leu Ile Glu Asn Tyr Thr Asp Val
355 360 365

Phe Asp Asp Thr Gln Val Glu Met Ile Asp Glu Val Thr Asn
370 375 380

<210> 48
<211> 389
<212> PRT
<213> Human coronavirus 229E

<400> 48

Met Ala Thr Val Lys Trp Ala Asp Ala Ser Glu Pro Gln Arg Gly Arg
1 5 10 15

Gln Gly Arg Ile Pro Tyr Ser Leu Tyr Ser Pro Leu Leu Val Asp Ser
20 25 30

Glu Gln Pro Trp Lys Val Ile Pro Arg Asn Leu Val Pro Ile Asn Lys
35 40 45

Lys Asp Lys Asn Lys Leu Ile Gly Tyr Trp Asn Val Gln Lys Arg Phe
50 55 60

Arg Thr Arg Lys Gly Lys Arg Val Asp Leu Ser Pro Lys Leu His Phe
65 70 75 80

Tyr Tyr Leu Gly Thr Gly Pro His Lys Asp Ala Lys Phe Arg Glu Arg
85 90 95

Val Glu Gly Val Val Trp Val Ala Val Asp Gly Ala Lys Thr Glu Pro
100 105 110

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Thr Gly Tyr Gly Val Arg Arg Lys Asn Ser Glu Pro Glu Ile Pro His
115 120 125

Phe Asn Gln Lys Leu Pro Asn Gly Val Thr Val Val Glu Glu Pro Asp
130 135 140

Ser Arg Ala Pro Ser Arg Ser Gln Ser Arg Ser Gln Ser Arg Gly Arg
145 150 155 160

Gly Glu Ser Lys Pro Gln Ser Arg Asn Pro Ser Ser Asp Arg Asn His
165 170 175

Asn Ser Gln Asp Asp Ile Met Lys Ala Val Ala Ala Ala Leu Lys Ser
180 185 190

Leu Gly Phe Asp Lys Pro Gln Glu Lys Asp Lys Lys Ser Ala Lys Thr
195 200 205

Gly Thr Pro Lys Pro Ser Arg Asn Gln Ser Pro Ala Ser Ser Gln Thr
210 215 220

Ser Ala Lys Ser Leu Ala Arg Ser Gln Ser Ser Glu Thr Lys Glu Gln
225 230 235 240

Lys His Glu Met Gln Lys Pro Arg Trp Lys Arg Gln Pro Asn Asp Asp
245 250 255

Val Thr Ser Asn Val Thr Gln Cys Phe Gly Pro Arg Asp Leu Asp His
260 265 270

Asn Phe Gly Ser Ala Gly Val Val Ala Asn Gly Val Lys Ala Lys Gly
275 280 285

Tyr Pro Gln Phe Ala Glu Leu Val Pro Ser Thr Ala Ala Met Leu Phe
290 295 300

Asp Ser His Ile Val Ser Lys Glu Ser Gly Asn Thr Val Val Leu Thr
305 310 315 320

Phe Thr Thr Arg Val Thr Val Pro Lys Asp His Pro His Leu Gly Lys
325 330 335

Phe Leu Glu Glu Leu Asn Ala Phe Thr Arg Glu Met Gln Gln His Pro
340 345 350

Leu Leu Asn Pro Ser Ala Leu Glu Phe Asn Pro Ser Gln Thr Ser Pro
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355

Ala Thr Ala Glu Pro Val Arg Asp Glu Val Ser Ile Glu Thr Asp Ile
370 375 380

Ile Asp Glu Val Asn
385

<210> 49
<211> 448
<212> PRT
<213> Human coronavirus

<400> 49

Met Ser Phe Thr Pro Gly Lys Gln Ser Ser Ser Arg Ala Ser Ser Gly
1 5 10 15

Asn Arg Ser Gly Asn Gly Ile Leu Lys Trp Ala Asp Gln Ser Asp Gln
20 25 30

Val Arg Asn Val Gln Thr Arg Gly Arg Arg Ala Gln Pro Lys Gln Thr
35 40 45

Ala Thr Ser Gln Gln Pro Ser Gly Gly Asn Val Val Pro Tyr Tyr Ser
50 55 60

Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu Phe Glu Phe
65 70 75 80

Val Glu Gly Gln Gly Pro Pro Ile Ala Pro Gly Val Pro Ala Thr Glu
85 90 95

Ala Lys Gly Tyr Trp Tyr Arg His Asn Arg Gly Ser Phe Lys Thr Ala
100 105 110

Asp Gly Asn Gln Arg Gln Leu Leu Pro Arg Trp Tyr Phe Tyr Tyr Leu
115 120 125

Gly Thr Gly Pro His Ala Lys Asp Gln Tyr Gly Thr Asp Ile Asp Gly
130 135 140

Val Tyr Trp Val Ala Ser Asn Gln Ala Asp Val Asn Thr Pro Ala Asp
145 150 155 160

Ile Val Asp Arg Asp Pro Ser Ser Asp Glu Ala Ile Pro Thr Arg Phe
165 170 175

Pro Pro Gly Thr Val Leu Pro Gln Gly Tyr Tyr Ile Glu Gly Ser Gly
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185

190

Arg Ser Ala Pro Asn Ser Arg Ser Thr Ser Arg Thr Ser Ser Arg Ala
 195 200 205

Ser Ser Ala Gly Ser Arg Ser Arg Ala Asn Ser Gly Asn Arg Thr Pro
 210 215 220

Thr Ser Gly Val Thr Pro Asp Met Ala Asp Gln Ile Ala Ser Leu Val
 225 230 235 240

Leu Ala Lys Leu Gly Lys Asp Ala Thr Lys Pro Gln Gln Val Thr Lys
 245 250 255

His Thr Ala Lys Glu Val Arg Gln Lys Ile Leu Asn Lys Pro Arg Gln
 260 265 270

Lys Arg Ser Pro Asn Lys Gln Cys Thr Val Gln Gln Cys Phe Gly Lys
 275 280 285

Arg Gly Pro Asn Gln Asn Phe Gly Gly Gly Glu Met Leu Lys Leu Gly
 290 295 300

Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr Ala
 305 310 315 320

Gly Ala Phe Phe Phe Gly Ser Arg Leu Glu Leu Ala Lys Val Gln Asn
 325 330 335

Leu Ser Gly Asn Pro Asp Glu Pro Gln Lys Asp Val Tyr Glu Leu Arg
 340 345 350

Tyr Asn Gly Ala Ile Arg Phe Asp Ser Thr Leu Ser Gly Phe Glu Thr
 355 360 365

Ile Met Lys Val Leu Asn Glu Asn Leu Asn Ala Tyr Gln Gln Gln Asp
 370 375 380

Gly Met Met Asn Met Ser Pro Lys Pro Gln Arg Gln Arg Gly His Lys
 385 390 395 400

Asn Gly Gln Gly Glu Asn Asp Asn Ile Ser Val Ala Val Pro Lys Ser
 405 410 415

Arg Val Gln Gln Asn Lys Ser Arg Glu Leu Thr Ala Glu Asp Ile Ser
 420 425 430

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Leu Leu Lys Lys Met Asp Glu Pro Tyr Thr Glu Asp Thr Ser Glu Ile
435 440 445

<210> 50
<211> 449
<212> PRT
<213> porcine hemagglutinating encephalomyelitis
<400> 50

Met Ser Phe Thr Pro Gly Lys Gln Ser Ser Ser Arg Ala Ser Ser Gly
1 5 10 15

Asn Arg Ser Gly Asn Gly Ile Leu Lys Trp Ala Asp Gln Ser Asp Gln
20 25 30

Ser Arg Asn Val Gln Thr Arg Gly Arg Arg Val Gln Ser Lys Gln Thr
35 40 45

Ala Thr Ser Gln Gln Pro Ser Gly Gly Thr Val Val Pro Tyr Tyr Ser
50 55 60

Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu Phe Glu Phe
65 70 75 80

Ala Glu Gly Gln Gly Val Pro Ile Ala Pro Gly Val Pro Ser Thr Glu
85 90 95

Ala Lys Gly Tyr Trp Tyr Arg His Asn Arg Arg Ser Phe Lys Thr Ala
100 105 110

Asp Gly Asn Gln Arg Gln Leu Leu Pro Arg Trp Tyr Phe Tyr Tyr Leu
115 120 125

Gly Thr Gly Pro His Ala Lys Asp Gln Tyr Gly Thr Asp Ile Asp Gly
130 135 140

Val Phe Trp Val Ala Ser Asn Gln Ala Asp Ile Asn Thr Pro Ala Asp
145 150 155 160

Ile Val Asp Arg Asp Pro Ser Ser Asp Glu Ala Ile Pro Thr Arg Phe
165 170 175

Pro Pro Gly Thr Val Leu Pro Gln Gly Tyr Tyr Ile Glu Gly Ser Gly
180 185 190

Arg Ser Ala Pro Asn Ser Arg Ser Thr Ser Arg Ala Pro Asn Arg Ala
195 200 205

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Pro Ser Ala Gly Ser Arg Ser Arg Ala Asn Ser Gly Asn Arg Thr Ser
 210 215 220

Thr Pro Gly Val Thr Pro Asp Met Ala Asp Gln Ile Ala Ser Leu Val
 225 230 235 240

Leu Ala Lys Leu Gly Lys Asp Ala Thr Lys Pro Gln Gln Val Thr Lys
 245 250 255

Gln Thr Ala Lys Glu Val Arg Gln Lys Ile Leu Asn Lys Pro Arg Gln
 260 265 270

Lys Arg Ser Pro Asn Lys Gln Cys Thr Val Gln Gln Cys Phe Gly Lys
 275 280 285

Arg Gly Pro Asn Gln Asn Phe Gly Gly Gly Glu Met Leu Lys Leu Gly
 290 295 300

Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr Ala
 305 310 315 320

Gly Ala Phe Phe Phe Gly Ser Arg Leu Glu Leu Ala Lys Val Gln Asn
 325 330 335

Leu Ser Gly Asn Pro Asp Glu Pro Gln Lys Asp Val Tyr Glu Leu Arg
 340 345 350

Tyr Asn Gly Ala Ile Arg Phe Asp Ser Thr Leu Ser Gly Phe Glu Thr
 355 360 365

Ile Met Lys Val Leu Asn Gln Asn Leu Asn Ala Tyr Gln His Gln Glu
 370 375 380

Asp Gly Met Met Asn Ile Ser Pro Lys Pro Gln Arg Gln Arg Gly Gln
 385 390 395 400

Lys Asn Gly Gln Val Glu Asn Asp Asn Val Ser Val Ala Ala Pro Lys
 405 410 415

Ser Arg Val Gln Gln Asn Lys Ser Arg Glu Leu Thr Ala Glu Asp Ile
 420 425 430

Ser Leu Leu Lys Lys Met Asp Glu Pro Tyr Thr Glu Asp Thr Ser Glu
 435 440 445

Ile

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<210> 51
 <211> 409
 <212> PRT
 <213> turkey coronavirus

<400> 51

Met Ala Ser Gly Lys Ala Thr Gly Lys Thr Asp Ala Pro Ala Pro Ile
 1 5 10 15

Ile Lys Leu Gly Gly Pro Lys Pro Pro Lys Val Gly Ser Ser Gly Asn
 20 25 30

Ala Ser Trp Phe Gln Ser Ile Lys Ala Lys Lys Leu Asn Ser Pro Gln
 35 40 45

Pro Lys Phe Glu Gly Ser Gly Val Pro Asp Asn Glu Asn Ile Lys Thr
 50 55 60

Ser Gln Gln His Gly Tyr Trp Arg Arg Gln Ala Arg Phe Lys Pro Gly
 65 70 75 80

Lys Gly Gly Arg Lys Pro Val Pro Asp Ala Trp Tyr Phe Tyr Tyr Thr
 85 90 95

Gly Thr Gly Pro Ala Ala Asp Leu Asn Trp Gly Asp Thr Gln Asp Gly
 100 105 110

Ile Val Trp Val Ala Ala Lys Gly Ala Asp Val Lys Ser Arg Ser Asn
 115 120 125

Gln Gly Thr Arg Asp Pro Asp Lys Phe Asp Gln Tyr Pro Leu Arg Phe
 130 135 140

Ser Asp Gly Gly Pro Asp Ser Asn Phe Arg Trp Asp Phe Ile Pro Leu
 145 150 155 160

His Arg Gly Arg Ser Gly Arg Ser Thr Ala Ala Ser Ser Ala Ala Ser
 165 170 175

Ser Arg Ala Pro Ser Arg Asp Gly Ser Arg Gly Arg Arg Ser Gly Ser
 180 185 190

Glu Asp Asp Leu Ile Ala Arg Ala Ala Lys Ile Ile Gln Asp Gln Gln
 195 200 205

Lys Lys Gly Ser Arg Ile Thr Lys Ala Lys Ala Asp Glu Met Ala His
 210 215 220

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Arg Arg Tyr Cys Lys Arg Thr Val Pro Pro Gly Tyr Lys Val Asp Gln
225 230 235 240

Val Phe Gly Pro Arg Thr Lys Gly Lys Glu Gly Asn Phe Gly Asp Asp
245 250 255

Lys Met Asn Glu Glu Gly Ile Lys Asp Gly Arg Val Thr Ala Met Leu
260 265 270

Asn Leu Val Pro Ser Ser His Ala Cys Leu Phe Gly Ser Arg Val Thr
275 280 285

Pro Lys Leu Gln Pro Asp Gly Leu His Leu Arg Phe Glu Phe Thr Thr
290 295 300

Val Val Pro Arg Asp Asp Pro Gln Phe Asp Asn Tyr Val Thr Ile Cys
305 310 315 320

Asp Gln Cys Val Asp Gly Ile Gly Thr Arg Pro Lys Asp Asn Glu Pro
325 330 335

Arg Pro Lys Ser Arg Pro Ser Ser Arg Pro Ala Thr Arg Gly Asn Ser
340 345 350

Pro Ala Pro Arg Gln Gln Arg Pro Lys Lys Glu Lys Lys Pro Lys Lys
355 360 365

Gln Asp Asp Glu Val Asp Lys Ala Leu Thr Ser Asp Glu Glu Arg Asn
370 375 380

Asn Ala Gln Leu Glu Phe Asp Asp Glu Pro Lys Val Ile Asn Trp Gly
385 390 395 400

Asp Ser Ala Leu Gly Glu Asn His Leu
405

<210> 52
<211> 1173
<212> PRT
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val Gly Tyr Ser Glu Asn val Phe Ala val Glu Ser Gly Gly Tyr Ile
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 Pro Ser Asp Phe Ala Phe Asn Asn Trp Phe Leu Leu Thr Asn Thr Ser
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 Ser val val Asp Gly val val Arg Ser Phe Gln Pro Leu Leu Leu Asn
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 Cys Leu Trp Ser val Ser Gly Leu Arg Phe Thr Thr Gly Phe val Tyr
 85 90 95
 Phe Asn Gly Thr Gly Arg Gly Asp Cys Lys Gly Phe Ser Ser Asp val
 100 105 110
 Leu Ser Asp val Ile Arg Tyr Asn Leu Asn Phe Glu Glu Asn Leu Arg
 115 120 125
 Arg Gly Thr Ile Leu Phe Lys Thr Ser Tyr Gly val val val Phe Tyr
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 Cys Thr Asn Asn Thr Leu val Ser Gly Asp Ala His Ile Pro Phe Gly
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 Thr val Leu Gly Asn Phe Tyr Cys Phe val Asn Thr Thr Ile Gly Thr
 165 170 175
 Glu Thr Thr Ser Ala Phe val Gly Ala Leu Pro Lys Thr val Arg Glu
 180 185 190
 Phe val Ile Ser Arg Thr Gly His Phe Tyr Ile Asn Gly Tyr Arg Tyr
 195 200 205
 Phe Thr Leu Gly Asn val Glu Ala val Asn Phe Asn val Thr Thr Ala
 210 215 220
 Glu Thr Thr Asp Phe Phe Thr val Ala Leu Ala Ser Tyr Ala Asp val
 225 230 235 240
 Leu val Asn val Ser Gln Thr Ser Ile Ala Asn Ile Ile Tyr Cys Asn
 245 250 255
 Ser val Ile Asn Arg Leu Arg Cys Asp Gln Leu Ser Phe Tyr val Pro
 260 265 270
 Asp Gly Phe Tyr Ser Thr Ser Pro Ile Gln Ser val Glu Leu Pro val
 275 280 285

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Ser Ile Val Ser Leu Pro Val Tyr His Lys His Met Phe Ile Val Leu
290 295 300

Tyr Val Asp Phe Lys Pro Gln Ser Gly Gly Gly Lys Cys Phe Asn Cys
305 310 315 320

Tyr Pro Ala Gly Val Asn Ile Thr Leu Ala Asn Phe Asn Glu Thr Lys
325 330 335

Gly Pro Leu Cys Val Asp Thr Ser His Phe Thr Thr Lys Tyr Val Ala
340 345 350

Val Tyr Ala Asn Val Gly Arg Trp Ser Ala Ser Ile Asn Thr Gly Asn
355 360 365

Cys Pro Phe Ser Phe Gly Lys Val Asn Asn Phe Val Lys Phe Gly Ser
370 375 380

Val Cys Phe Ser Leu Lys Asp Ile Pro Gly Gly Cys Ala Met Pro Ile
385 390 395 400

Val Ala Asn Trp Ala Tyr Ser Lys Tyr Tyr Thr Ile Gly Thr Leu Tyr
405 410 415

Val Ser Trp Ser Asp Gly Asp Gly Ile Thr Gly Val Pro Gln Pro Val
420 425 430

Glu Gly Val Ser Ser Phe Met Asn Val Thr Leu Asp Lys Cys Thr Lys
435 440 445

Tyr Asn Ile Tyr Asp Val Ser Gly Val Gly Val Ile Arg Val Ser Asn
450 455 460

Asp Thr Phe Leu Asn Gly Ile Thr Tyr Thr Ser Thr Ser Gly Asn Leu
465 470 475 480

Leu Gly Phe Lys Asp Val Thr Lys Gly Thr Ile Tyr Ser Ile Thr Pro
485 490 495

Cys Asn Pro Pro Asp Gln Leu Val Val Tyr Gln Gln Ala Val Val Gly
500 505 510

Ala Met Leu Ser Glu Asn Phe Thr Ser Tyr Gly Phe Ser Asn Val Val
515 520 525

Glu Leu Pro Lys Phe Phe Tyr Ala Ser Asn Gly Thr Tyr Asn Cys Thr
Page 86

530

Asp Ala Val Leu Thr Tyr Ser Ser Phe Gly Val Cys Ala Asp Gly Ser
545 550 555 560

Ile Ile Ala Val Gln Pro Arg Asn Val Ser Tyr Asp Ser Val Ser Ala
565 570 575

Ile Val Thr Ala Asn Leu Ser Ile Pro Ser Asn Trp Thr Ile Ser Val
580 585 590

Gln Val Glu Tyr Leu Gln Ile Thr Ser Thr Pro Ile Val Val Asp Cys
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Ser Thr Tyr Val Cys Asn Gly Asn Val Arg Cys Val Glu Leu Leu Lys
610 615 620

Gln Tyr Thr Ser Ala Cys Lys Thr Ile Glu Asp Ala Leu Arg Asn Ser
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Ala Arg Leu Glu Ser Ala Asp Val Ser Glu Met Leu Thr Phe Asp Lys
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Lys Ala Phe Thr Leu Ala Asn Val Ser Ser Phe Gly Asp Tyr Asn Leu
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Ser Ser Val Ile Pro Ser Leu Pro Thr Ser Gly Ser Arg Val Ala Gly
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Arg Ser Ala Ile Glu Asp Ile Leu Phe Ser Lys Ile Val Thr Ser Gly
690 695 700

Leu Gly Thr Val Asp Ala Asp Tyr Lys Asn Cys Thr Lys Gly Leu Ser
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Ile Ala Asp Leu Ala Cys Ala Gln Tyr Tyr Asn Gly Ile Met Val Leu
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Pro Gly Val Ala Asp Ala Glu Arg Met Ala Met Tyr Thr Gly Ser Leu
740 745 750

Ile Gly Gly Ile Ala Leu Gly Gly Leu Thr Ser Ala Val Ser Ile Pro
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Phe Ser Leu Ala Ile Gln Ala Arg Leu Asn Tyr Val Ala Leu Gln Thr
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785 790 795 800

Ala Met Thr Asn Ile Val Asp Ala Phe Thr Gly Val Asn Asp Ala Ile
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Thr Gln Thr Ser Gln Ala Leu Gln Thr Val Ala Thr Ala Leu Asn Lys
820 825 830

Ile Gln Asp Val Val Asn Gln Gln Gly Asn Ser Leu Asn His Leu Thr
835 840 845

Ser Gln Leu Arg Gln Asn Phe Gln Ala Ile Ser Ser Ser Ile Gln Ala
850 855 860

Ile Tyr Asp Arg Leu Asp Thr Ile Gln Ala Asp Gln Gln Val Asp Arg
865 870 875 880

Leu Ile Thr Gly Arg Leu Ala Ala Leu Asn Val Phe Val Ser His Thr
885 890 895

Leu Thr Lys Tyr Thr Glu Val Arg Ala Ser Arg Gln Leu Ala Gln Gln
900 905 910

Lys Val Asn Glu Cys Val Lys Ser Gln Ser Lys Arg Tyr Gly Phe Cys
915 920 925

Gly Asn Gly Thr His Ile Phe Ser Ile Val Asn Ala Ala Pro Glu Gly
930 935 940

Leu Val Phe Leu His Thr Val Leu Leu Pro Thr Gln Tyr Lys Asp Val
945 950 955 960

Glu Ala Trp Ser Gly Leu Cys Val Asp Gly Thr Asn Gly Tyr Val Leu
965 970 975

Arg Gln Pro Asn Leu Ala Leu Tyr Lys Glu Gly Asn Tyr Tyr Arg Ile
980 985 990

Thr Ser Arg Ile Met Phe Glu Pro Arg Ile Pro Thr Met Ala Asp Phe
995 1000 1005

Val Gln Ile Glu Asn Cys Asn Val Thr Phe Val Asn Ile Ser Arg
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Ser Glu Leu Gln Thr Ile Val Pro Glu Tyr Ile Asp Val Asn Lys
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Thr Leu Gln Glu Leu Ser Tyr Lys Leu Pro Asn Tyr Thr Val Pro
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Asp Leu Val Val Glu Gln Tyr Asn Gln Thr Ile Leu Asn Leu Thr
1055 1060 1065

Ser Glu Ile Ser Thr Leu Glu Asn Lys Ser Ala Glu Leu Asn Tyr
1070 1075 1080

Thr Val Gln Lys Leu Gln Thr Leu Ile Asp Asn Ile Asn Ser Thr
1085 1090 1095

Leu Val Asp Leu Lys Trp Leu Asn Arg Val Glu Thr Tyr Ile Lys
1100 1105 1110

Trp Pro Trp Trp Val Trp Leu Cys Ile Ser Val Val Leu Ile Phe
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Val Val Ser Met Leu Leu Leu Cys Cys Cys Ser Thr Gly Cys Cys
1130 1135 1140

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Ser Thr Lys Leu Pro Tyr Tyr Asp Val Glu Lys Ile His Ile Gln
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<213> Avian infectious bronchitis virus

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35 40 45

Val Val Asn Ser Ser Asn Tyr Ala Asn Asn Ala Gly Ser Ala Ser Glu
50 55 60

Cys Thr Val Gly Val Ile Lys Asp Val Tyr Asn Gln Ser Ala Ala Ser
65 70 75 80

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Ile Ala Met Thr Ala Pro Leu Gln Gly Met Ala Trp Ser Lys Ser Gln
85 90 95

Phe Cys Ser Ala His Cys Asp Phe Ser Glu Ile Thr Val Phe Val Thr
100 105 110

His Cys Tyr Ser Ser Gly Ser Gly Ser Cys Pro Ile Thr Gly Met Ile
115 120 125

Ala Arg Gly His Ile Arg Ile Ser Ala Met Lys Asn Gly Ser Leu Phe
130 135 140

Tyr Asn Leu Thr Val Ser Val Ser Lys Tyr Pro Asn Phe Lys Ser Phe
145 150 155 160

Gln Cys Val Asn Asn Phe Thr Ser Val Tyr Leu Asn Gly Asp Leu Val
165 170 175

Phe Thr Ser Asn Lys Thr Thr Asp Val Thr Ser Ala Gly Val Tyr Phe
180 185 190

Lys Ala Gly Gly Pro Val Asn Tyr Ser Ile Met Lys Glu Phe Lys Val
195 200 205

Leu Ala Tyr Phe Val Asn Gly Thr Ala Gln Asp Val Ile Leu Cys Asp
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Asn Ser Pro Lys Gly Leu Leu Ala Cys Gln Tyr Asn Thr Gly Asn Phe
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Ser Asp Gly Phe Tyr Pro Phe Thr Asn Ser Thr Leu Val Arg Glu Lys
245 250 255

Phe Ile Val Tyr Arg Glu Ser Ser Val Asn Thr Thr Leu Ala Leu Thr
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Asn Phe Thr Phe Thr Asn Val Ser Asn Ala Gln Pro Asn Ser Gly Gly
275 280 285

Val His Thr Phe His Leu Tyr Gln Thr Gln Thr Ala Gln Ser Gly Tyr
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Tyr Asn Phe Asn Leu Ser Phe Leu Ser Gln Phe Val Tyr Lys Ala Ser
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Asp Tyr Met Tyr Gly Ser Tyr His Pro Ile Cys Ala Phe Arg Pro Glu
325 330 335

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Thr Ile Asn Ser Gly Leu Trp Phe Asn Ser Leu Ser Val Ser Leu Thr
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Tyr Gly Pro Leu Gln Gly Gly Tyr Lys Gln Ser Val Phe Ser Gly Lys
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Ala Thr Cys Cys Tyr Ala Tyr Ser Tyr Asn Gly Pro Arg Ala Cys Lys
370 375 380

Gly Val Tyr Ser Gly Glu Leu Ser Arg Asp Phe Glu Cys Gly Leu Leu
385 390 395 400

Val Tyr Val Thr Lys Ser Asp Gly Ser Arg Ile Gln Thr Arg Thr Glu
405 410 415

Pro Leu Val Leu Thr Gln His Asn Tyr Asn Asn Ile Thr Leu Asp Lys
420 425 430

Cys Val Ala Tyr Asn Ile Tyr Gly Arg Val Gly Gln Gly Phe Ile Thr
435 440 445

Asn Val Thr Asp Ser Val Ala Asn Phe Ser Tyr Leu Ala Asp Gly Gly
450 455 460

Leu Ala Ile Leu Asp Thr Ser Gly Ala Ile Asp Val Phe Val Val Gln
465 470 475 480

Gly Ser Tyr Gly Leu Asn Tyr Tyr Lys Val Asn Pro Cys Glu Asp Val
485 490 495

Asn Gln Gln Phe Val Val Ser Gly Gly Asn Ile Val Gly Ile Leu Thr
500 505 510

Ser Arg Asn Glu Thr Gly Ser Glu Gln Val Glu Asn Gln Phe Tyr Val
515 520 525

Lys Leu Thr Asn Ser Ser His Arg Arg Arg Arg Ser Ile Gly Gln Asn
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Val Thr Ser Cys Pro Tyr Val Ser Tyr Gly Arg Phe Cys Ile Glu Pro
545 550 555 560

Asp Gly Ser Leu Lys Met Ile Val Pro Glu Glu Leu Lys Gln Phe Val
565 570 575

Ala Pro Leu Leu Asn Ile Thr Glu Ser Val Leu Ile Pro Asn Ser Phe

580

585

590

Asn Leu Thr Val Thr Asp Glu Tyr Ile Gln Thr Arg Met Asp Lys Val
595 600 605

Gln Ile Asn Cys Leu Gln Tyr Val Cys Gly Asn Ser Leu Glu Cys Arg
610 615 620

Lys Leu Phe Gln Gln Tyr Gly Pro Val Cys Asp Asn Ile Leu Ser Val
625 630 635 640

Val Asn Ser Val Ser Gln Lys Glu Asp Met Glu Leu Leu Ser Phe Tyr
645 650 655

Ser Ser Thr Lys Pro Lys Gly Tyr Asp Thr Pro Val Leu Ser Asn Val
660 665 670

Ser Thr Gly Glu Phe Asn Ile Ser Leu Leu Leu Thr Pro Pro Ser Ser
675 680 685

Pro Ser Gly Arg Ser Phe Val Glu Asp Leu Leu Phe Thr Ser Val Glu
690 695 700

Thr Val Gly Leu Pro Thr Asp Ala Glu Tyr Lys Lys Cys Thr Ala Gly
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Pro Leu Gly Thr Leu Lys Asp Leu Ile Cys Ala Arg Glu Tyr Asn Gly
725 730 735

Leu Leu Val Leu Pro Pro Ile Ile Thr Ala Asp Met Gln Thr Met Tyr
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755 760 765

Ala Ala Ile Pro Phe Ala Thr Gln Ile Gln Ala Arg Ile Asn His Leu
770 775 780

Gly Ile Ala Gln Ser Leu Leu Met Lys Asn Gln Glu Lys Ile Ala Ala
785 790 795 800

Ser Phe Asn Lys Ala Ile Gly His Met Gln Glu Gly Phe Arg Ser Thr
805 810 815

Ser Leu Ala Leu Gln Gln Val Gln Asp Val Val Asn Lys Gln Ser Ala
820 825 830

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Ile Leu Thr Glu Thr Met Asn Ser Leu Asn Lys Asn Phe Gly Ala Ile
835 840 845

Ser Ser Val Ile Gln Asp Ile Tyr Ala Gln Leu Asp Ala Ile Gln Ala
850 855 860

Asp Ala Gln Val Asp Arg Leu Ile Thr Gly Arg Leu Ser Ser Leu Ser
865 870 875 880

Val Leu Ala Ser Ala Lys Gln Ser Glu Tyr Ile Arg Val Ser Gln Gln
885 890 895

Arg Glu Leu Ala Thr Gln Lys Ile Asn Glu Cys Val Lys Ser Gln Ser
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Asn Arg Tyr Gly Phe Cys Gly Ser Gly Arg His Val Leu Ser Ile Pro
915 920 925

Gln Asn Ala Pro Asn Gly Ile Val Phe Ile His Phe Thr Tyr Thr Pro
930 935 940

Glu Thr Phe Val Asn Val Thr Ala Ile Val Gly Phe Cys Val Asn Pro
945 950 955 960

Leu Asn Ala Ser Gln Tyr Ala Ile Val Pro Ala Asn Gly Arg Gly Ile
965 970 975

Phe Ile Gln Val Asn Gly Thr Tyr Tyr Ile Thr Ser Arg Asp Met Tyr
980 985 990

Met Pro Arg Asp Ile Thr Ala Gly Asp Ile Val Thr Leu Thr Ser Cys
995 1000 1005

Gln Ala Asn Tyr Val Asn Val Asn Lys Thr Val Ile Thr Thr Phe
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Val Glu Asp Asp Asp Phe Asn Phe Asp Asp Glu Leu Ser Lys Trp
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Trp Asn Asp Thr Lys His Gly Leu Pro Asp Phe Asp Asp Phe Asn
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Tyr Thr Val Pro Ile Leu Asn Ile Ser Gly Glu Ile Asp Asn Ile
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Gln Gly Val Ile Gln Gly Leu Asn Asp Ser Leu Ile Asn Leu Glu
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Glu Leu Ser Ile Ile Lys Thr Tyr Ile Lys Trp Pro Trp Tyr Val
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Trp Leu Ala Ile Gly Phe Ala Ile Ile Ile Phe Ile Leu Ile Leu
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1115 1120 1125

Cys Phe Gly Ile Ile Pro Leu Ile Ser Lys Cys Gly Lys Lys Ser
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Arg Pro Lys Lys Ser Val
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Asn Gly Tyr Tyr Pro Thr Ser Gly Ser Thr Tyr Arg Asn Met Ala Leu
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Lys Gly Thr Leu Leu Leu Ser Arg Leu Trp Phe Lys Pro Pro Phe Leu
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Ser Asp Phe Ile Asn Gly Ile Phe Ala Lys Val Lys Asn Thr Lys Val
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Ile Lys Lys Gly Val Met Tyr Ser Glu Phe Pro Ala Ile Thr Ile Gly
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Ser Thr Phe Val Asn Thr Ser Tyr Ser Val Val Val Gln Pro His Thr
130 135 140

Thr Asn Leu Asp Asn Lys Leu Gln Gly Leu Leu Glu Ile Ser Val Cys
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Gln Tyr Thr Met Cys Glu Tyr Pro His Thr Ile Cys His Pro Lys Leu
165 170 175

Gly Asn Lys Arg Val Glu Leu Trp His Trp Asp Thr Gly Val Val Ser
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Cys Leu Tyr Lys Arg Asn Phe Thr Tyr Asp Val Asn Ala Asp Tyr Leu
195 200 205

Tyr Phe His Phe Tyr Gln Glu Gly Gly Thr Phe Tyr Ala Tyr Phe Thr
210 215 220

Asp Thr Gly Val Val Thr Lys Phe Leu Phe Asn Val Tyr Leu Gly Thr
225 230 235 240

Val Leu Ser His Tyr Tyr Val Leu Pro Leu Thr Cys Ser Ser Ala Met
245 250 255

Thr Leu Glu Tyr Trp Val Thr Pro Leu Thr Ser Lys Gln Tyr Leu Leu
260 265 270

Ala Phe Asn Gln Asp Gly Val Ile Phe Asn Ala Val Asp Cys Lys Ser
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Asp Phe Met Ser Glu Ile Lys Cys Lys Thr Leu Ser Ile Ala Pro Ser
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Thr Gly Val Tyr Glu Leu Asn Gly Tyr Thr Val Gln Pro Ile Ala Asp
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Val Tyr Arg Arg Ile Pro Asn Leu Pro Asp Cys Asn Ile Glu Ala Trp
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Leu Asn Asp Lys Ser Val Pro Ser Pro Leu Asn Trp Glu Arg Lys Thr
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Phe Ser Asn Cys Asn Phe Asn Met Ser Ser Leu Met Ser Phe Ile Gln
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Ala Asp Ser Phe Thr Cys Asn Asn Ile Asp Ala Ala Lys Ile Tyr Gly
370 375 380

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Met Cys Phe Ser Ser Ile Thr Ile Asp Lys Phe Ala Ile Pro Asn Gly
385 390 395 400

Arg Lys Val Asp Leu Gln Leu Gly Asn Leu Gly Tyr Leu Gln Ser Phe
405 410 415

Asn Tyr Arg Ile Asp Thr Thr Ala Thr Ser Cys Gln Leu Tyr Tyr Asn
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Leu Pro Ala Ala Asn Val Ser Val Ser Arg Phe Asn Pro Ser Thr Trp
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Asn Arg Arg Phe Gly Phe Thr Glu Gln Phe Val Phe Lys Pro Gln Pro
450 455 460

Val Gly Val Phe Thr His His Asp Val Val Tyr Ala Gln His Cys Phe
465 470 475 480

Lys Ala Pro Lys Asn Phe Cys Pro Cys Lys Leu Asp Gly Ser Leu Cys
485 490 495

Val Gly Asn Gly Pro Gly Ile Asp Ala Gly Tyr Lys Asn Ser Gly Ile
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Gly Thr Cys Pro Ala Gly Thr Asn Tyr Leu Thr Cys His Asn Ala Ala
515 520 525

Gln Cys Asp Cys Leu Cys Thr Pro Asp Pro Ile Thr Ser Lys Ser Thr
530 535 540

Gly Pro Tyr Lys Cys Pro Gln Thr Lys Tyr Leu Val Gly Ile Gly Glu
545 550 555 560

His Cys Ser Gly Leu Ala Ile Lys Ser Asp Tyr Cys Gly Gly Asn Pro
565 570 575

Cys Thr Cys Gln Pro Gln Ala Phe Leu Gly Trp Ser Val Asp Ser Cys
580 585 590

Leu Gln Gly Asp Arg Cys Asn Ile Phe Ala Asn Phe Ile Phe His Asp
595 600 605

Val Asn Ser Gly Thr Thr Cys Ser Thr Asp Leu Gln Lys Ser Asn Thr
610 615 620

Asp Ile Ile Leu Gly Val Cys Val Asn Tyr Asp Leu Tyr Gly Ile Thr
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Leu	Gln	Pro	Ile	Asn 725	Tyr	Phe	Asp	Ser	Tyr 730	Leu	Gly	Cys	Val	Val 735	Asn
Ala	Asp	Asn	Ser 740	Thr	Ser	Ser	Val	Val 745	Gln	Thr	Cys	Asp	Leu 750	Thr	Val
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Ala	Ile 770	Thr	Thr	Gly	Tyr	Arg 775	Phe	Thr	Asn	Phe	Glu 780	Pro	Phe	Thr	Val
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Asp	Asn 850	Ile	Asn	Ala	Ile	Leu 855	Thr	Glu	Val	Asn	Glu 860	Leu	Leu	Asp	Thr
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Thr Lys Leu Lys Asp Gly Val Asn Phe Asn Val Asp Asp Ile Asn Phe
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Ser Pro Val Leu Gly Cys Leu Gly Ser Ala Cys Asn Lys Val Ser Ser
900 905 910

Arg Ser Ala Ile Glu Asp Leu Leu Phe Ser Lys Val Lys Leu Ser Asp
915 920 925

Val Gly Phe Val Glu Ala Tyr Asn Asn Cys Thr Gly Gly Ala Glu Ile
930 935 940

Arg Asp Leu Ile Cys Val Gln Ser Tyr Asn Gly Ile Lys Val Leu Pro
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Pro Leu Leu Ser Val Asn Gln Ile Ser Gly Tyr Thr Leu Ala Ala Thr
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Ser Ala Ser Leu Phe Pro Pro Leu Ser Ala Ala Val Gly Val Pro Phe
980 985 990

Tyr Leu Asn Val Gln Tyr Arg Ile Asn Gly Ile Gly Val Thr Met Asp
995 1000 1005

Val Leu Ser Gln Asn Gln Lys Leu Ile Ala Asn Ala Phe Asn Asn
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Ala Leu Asp Ala Ile Gln Glu Gly Phe Asp Ala Thr Asn Ser Ala
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Ser Ser Leu Gln Glu Ile Leu Ser Arg Leu Asp Ala Leu Glu Ala
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Gln Ala Gln Ile Asp Arg Leu Ile Asn Gly Arg Leu Thr Ala Leu
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Asn Val Tyr Val Ser Gln Gln Leu Ser Asp Ser Thr Leu Val Lys
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Gly Leu Cys Ile Ala Gly Asp Arg Gly Ile Ala Pro Lys Ser Gly
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1190 1195 1200

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Ser Thr Cys Ala Val Asn Tyr Thr Lys Ala Pro Asp Val Met Leu
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Glu Leu Val Ile Lys Thr Ser His Asp Asp
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Pro Gly Asn Glu Asn Ile Ile Lys Asp Phe Leu Phe His Thr Phe Lys
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Tyr Asn Cys Ser Arg Ser Ala Thr Thr Thr Ala Tyr Lys Asp Phe Ser
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 85 90 95

Gly Asn Ala Arg Gly Lys Pro Leu Leu Val His Val His Gly Asp Pro
 100 105 110

Val Ser Ile Ile Ile Tyr Ile Ser Ala Tyr Arg Asp Asp Val Gln Pro
 115 120 125

Arg Pro Leu Leu Lys His Gly Leu Leu Cys Ile Thr Lys Asn Lys Ile
 130 135 140

Ile Asp Tyr Asn Thr Phe Thr Ser Ala Gln Trp Ser Ala Ile Cys Leu
 145 150 155 160

Gly Asp Asp Arg Lys Ile Pro Phe Ser Val Ile Pro Thr Asp Asn Gly
 165 170 175

Thr Lys Ile Phe Gly Leu Glu Trp Asn Asp Asp Tyr Val Thr Ala Tyr
 180 185 190

Ile Ser Asp Arg Ser His His Leu Asn Ile Asn Asn Asn Trp Phe Asn
 195 200 205

Asn Val Thr Ile Leu Tyr Ser Arg Ser Ser Ser Ala Thr Trp Gln Lys
 210 215 220

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Ser Ala Ala Tyr val Tyr Gln Gly Val Ser Asn Phe Thr Tyr Tyr Lys
225 230 235 240

Leu Asn Asn Thr Asn Gly Leu Lys Ser Tyr Glu Leu Cys Glu Asp Tyr
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Glu Tyr Cys Thr Gly Tyr Ala Thr Asn Val Phe Ala Pro Thr Val Gly
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Gly Tyr Ile Pro His Gly Phe Ser Phe Asn Asn Trp Phe Met Arg Thr
275 280 285

Asn Ser Ser Thr Phe Val Ser Gly Arg Phe Val Thr Asn Gln Pro Leu
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Leu Val Asn Cys Leu Trp Pro Val Pro Ser Phe Gly Val Ala Ala Gln
305 310 315 320

Gln Phe Cys Phe Glu Gly Ala Gln Phe Ser Gln Cys Asn Gly Val Ser
325 330 335

Leu Asn Asn Thr Val Asp Val Ile Arg Phe Asn Leu Asn Phe Thr Ala
340 345 350

Leu Val Gln Ser Gly Met Gly Ala Thr Val Phe Ser Leu Asn Thr Thr
355 360 365

Gly Gly Val Ile Leu Glu Ile Ser Cys Tyr Asn Asp Thr Val Ser Glu
370 375 380

Ser Ser Phe Tyr Ser Tyr Gly Glu Ile Ser Phe Gly Val Thr Asp Gly
385 390 395 400

Pro Arg Tyr Cys Phe Ala Leu Tyr Asn Gly Thr Ala Leu Lys Tyr Leu
405 410 415

Gly Thr Leu Pro Pro Ser Val Lys Glu Ile Ala Ile Ser Lys Trp Gly
420 425 430

His Phe Tyr Ile Asn Gly Tyr Asn Phe Phe Ser Thr Phe Pro Ile Asp
435 440 445

Cys Ile Ser Phe Asn Leu Thr Thr Gly Asp Ser Gly Ala Phe Trp Thr
450 455 460

Ile Ala Tyr Thr Ser Tyr Thr Asp Ala Leu Val Gln Val Glu Asn Thr
Page 101

465 470 475 480
 Ala Ile Lys Lys Val Thr Tyr Cys Asn Ser His Ile Asn Asn Ile Lys
 485 490 495
 Cys Ser Gln Leu Thr Ala Asn Leu Gln Asn Gly Phe Tyr Pro Val Ala
 500 505 510
 Ser Ser Glu Val Gly Leu Val Asn Lys Ser Val Val Leu Leu Pro Ser
 515 520 525
 Phe Tyr Ser His Thr Ser Val Asn Ile Thr Ile Asp Leu Gly Met Lys
 530 535 540
 Arg Ser Gly Tyr Gly Gln Pro Ile Ala Ser Thr Leu Ser Asn Ile Thr
 545 550 555 560
 Leu Pro Met Gln Asp Asn Asn Thr Asp Val Tyr Cys Ile Arg Ser Asn
 565 570 575
 Arg Phe Ser Val Tyr Phe His Ser Thr Cys Lys Ser Ser Leu Trp Asp
 580 585 590
 Asp Val Phe Asn Ser Asp Cys Thr Asp Val Leu Tyr Ala Thr Ala Val
 595 600 605
 Ile Lys Thr Gly Thr Cys Pro Phe Ser Phe Asp Lys Leu Asn Asn Tyr
 610 615 620
 Leu Thr Phe Asn Lys Phe Cys Leu Ser Leu Asn Pro Val Gly Ala Asn
 625 630 635 640
 Cys Lys Phe Asp Val Ala Ala Arg Thr Arg Thr Asn Glu Gln Val Val
 645 650 655
 Arg Ser Leu Tyr Val Ile Tyr Glu Glu Gly Asp Asn Ile Val Gly Val
 660 665 670
 Pro Ser Asp Asn Ser Gly Leu His Asp Leu Ser Val Leu His Leu Asp
 675 680 685
 Ser Cys Thr Asp Tyr Asn Ile Tyr Gly Ile Thr Gly Val Gly Ile Ile
 690 695 700
 Arg Gln Thr Asn Ser Thr Leu Leu Ser Gly Leu Tyr Tyr Thr Ser Leu
 705 710 715 720

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Ser Gly Asp Leu Leu Gly Phe Lys Asn Val Ser Asp Gly Val Ile Tyr
725 730 735

Ser Val Thr Pro Cys Asp Val Ser Ala His Ala Ala Val Ile Asp Gly
740 745 750

Ala Ile Val Gly Ala Met Thr Ser Ile Asn Ser Glu Leu Leu Gly Leu
755 760 765

Thr His Trp Thr Thr Thr Pro Asn Phe Tyr Tyr Tyr Ser Ile Tyr Asn
770 775 780

Tyr Thr Asn Glu Arg Thr Arg Gly Thr Ala Ile Asp Ser Asn Asp Val
785 790 795 800

Asp Cys Glu Pro Ile Ile Thr Tyr Ser Asn Ile Gly Val Cys Lys Asn
805 810 815

Gly Ala Leu Val Phe Ile Asn Val Thr His Ser Asp Gly Asp Val Gln
820 825 830

Pro Ile Ser Thr Gly Asn Val Thr Ile Pro Thr Asn Phe Thr Ile Ser
835 840 845

Val Gln Val Glu Tyr Ile Gln Val Tyr Thr Thr Pro Val Ser Ile Asp
850 855 860

Cys Ser Arg Tyr Val Cys Asn Gly Asn Pro Arg Cys Asn Lys Leu Leu
865 870 875 880

Thr Gln Tyr Val Ser Ala Cys Gln Thr Ile Glu Gln Ala Leu Ala Met
885 890 895

Gly Ala Arg Leu Glu Asn Met Glu Ile Asp Ser Met Leu Phe Val Ser
900 905 910

Glu Asn Ala Leu Lys Leu Ala Ser Val Glu Ala Phe Asn Ser Thr Glu
915 920 925

Thr Leu Asp Pro Ile Tyr Lys Glu Trp Pro Asn Ile Gly Gly Ser Trp
930 935 940

Leu Gly Gly Leu Lys Asp Ile Leu Pro Ser His Asn Ser Lys Arg Lys
945 950 955 960

Tyr Arg Ser Ala Ile Glu Asp Leu Leu Phe Asp Lys Val Val Thr Ser
965 970 975

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Gly Leu Gly Thr Val Asp Glu Asp Tyr Lys Arg Cys Thr Gly Gly Tyr
980 985 990

Asp Ile Ala Asp Leu Val Cys Ala Gln Tyr Tyr Asn Gly Ile Met Val
995 1000 1005

Leu Pro Gly Val Ala Asn Asp Asp Lys Met Ala Met Tyr Thr Ala
1010 1015 1020

Ser Leu Ala Gly Gly Ile Thr Leu Gly Ser Leu Gly Gly Gly Ala
1025 1030 1035

Val Ser Ile Pro Phe Ala Ile Ala Val Gln Ala Arg Leu Asn Tyr
1040 1045 1050

Val Ala Leu Gln Thr Asp Val Leu Asn Lys Asn Gln Gln Ile Leu
1055 1060 1065

Ala Asn Ala Phe Asn Gln Ala Ile Gly Asn Ile Thr Gln Ala Phe
1070 1075 1080

Gly Lys Val Asn Asp Ala Ile His Gln Thr Ser Gln Gly Leu Ala
1085 1090 1095

Thr Val Ala Lys Val Leu Ala Lys Val Gln Asp Val Val Asn Thr
1100 1105 1110

Gln Gly Gln Ala Leu Ser His Leu Thr Leu Gln Leu Gln Asn Asn
1115 1120 1125

Phe Gln Ala Ile Ser Ser Ser Ile Ser Asp Ile Tyr Asn Arg Leu
1130 1135 1140

Asp Glu Leu Ser Ala Asp Ala Gln Val Asp Arg Leu Ile Thr Gly
1145 1150 1155

Arg Leu Thr Ala Leu Asn Ala Phe Val Ser Gln Thr Leu Thr Arg
1160 1165 1170

Gln Ala Glu Val Arg Ala Ser Arg Gln Leu Ala Lys Asp Lys Val
1175 1180 1185

Asn Glu Cys Val Arg Ser Gln Ser Gln Arg Phe Gly Phe Cys Gly
1190 1195 1200

Asn Gly Thr His Leu Phe Ser Leu Ala Asn Ala Ala Pro Asn Gly
1205 1210 1215

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Met	Ile	Phe	Phe	His	Thr	Val	Leu	Leu	Pro	Thr	Ala	Tyr	Glu	Thr
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Val	Thr	Ala	Trp	Ser	Gly	Ile	Cys	Ala	Ser	Asp	Gly	Asp	Arg	Thr
	1235					1240					1245			
Phe	Gly	Leu	Val	Val	Lys	Asp	Val	Gln	Leu	Thr	Leu	Phe	Arg	Asn
	1250					1255					1260			
Leu	Asp	Asp	Lys	Phe	Tyr	Leu	Thr	Pro	Arg	Thr	Met	Tyr	Gln	Pro
	1265					1270					1275			
Ile	Val	Ala	Thr	Ser	Ser	Asp	Phe	Val	Gln	Ile	Glu	Gly	Cys	Asp
	1280					1285					1290			
Val	Leu	Phe	Val	Asn	Ala	Thr	Val	Ile	Asp	Leu	Pro	Ser	Ile	Ile
	1295					1300					1305			
Pro	Asp	Tyr	Ile	Asp	Ile	Asn	Gln	Thr	Val	Gln	Asp	Ile	Leu	Glu
	1310					1315					1320			
Asn	Phe	Arg	Pro	Asn	Trp	Thr	Val	Pro	Glu	Leu	Pro	Leu	Asp	Ile
	1325					1330					1335			
Phe	Asn	Ala	Thr	Tyr	Leu	Asn	Leu	Thr	Gly	Glu	Ile	Asn	Asp	Leu
	1340					1345					1350			
Glu	Phe	Arg	Ser	Glu	Lys	Leu	His	Asn	Thr	Thr	Val	Glu	Leu	Ala
	1355					1360					1365			
Ile	Leu	Ile	Asp	Asn	Ile	Asn	Asn	Thr	Leu	Val	Asn	Leu	Glu	Trp
	1370					1375					1380			
Leu	Asn	Arg	Ile	Glu	Thr	Tyr	Val	Lys	Trp	Pro	Trp	Tyr	Val	Trp
	1385					1390					1395			
Leu	Leu	Ile	Gly	Leu	Val	Val	Ile	Phe	Cys	Ile	Pro	Ile	Leu	Leu
	1400					1405					1410			
Phe	Cys	Cys	Cys	Ser	Thr	Gly	Cys	Cys	Gly	Cys	Ile	Gly	Cys	Leu
	1415					1420					1425			
Gly	Ser	Cys	Cys	His	Ser	Ile	Cys	Ser	Arg	Arg	Gln	Phe	Glu	Ser
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1445

<210> 56
<211> 1464
<212> PRT
<213> Feline infectious peritonitis virus

<400> 56

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Ala Pro His Gly Val Thr Leu Pro Gln Phe Asn Thr Ser His Asn Asn
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Glu Arg Phe Glu Leu Asn Phe Tyr Asn Phe Leu Gln Thr Trp Asp Ile
35 40 45

Pro Pro Asn Thr Glu Thr Ile Leu Gly Gly Tyr Leu Pro Tyr Cys Gly
50 55 60

Ala Gly Val Asn Cys Gly Trp Tyr Asn Phe Ser Gln Ser Val Gly Gln
65 70 75 80

Asn Gly Lys Tyr Ala Tyr Ile Asn Thr Gln Asn Leu Asn Ile Pro Asn
85 90 95

Val His Gly Val Tyr Phe Asp Val Arg Glu His Asn Asn Asp Gly Glu
100 105 110

Trp Asp Asp Arg Asp Lys Val Gly Leu Leu Ile Ala Ile His Gly Asn
115 120 125

Ser Lys Tyr Ser Leu Leu Met Val Leu Gln Asp Ala Val Glu Ala Asn
130 135 140

Gln Pro His Val Ala Val Lys Ile Cys His Trp Lys Pro Gly Asn Ile
145 150 155 160

Ser Ser Tyr His Ala Phe Ser Val Asn Leu Gly Asp Gly Gly Gln Cys
165 170 175

Val Phe Asn Gln Arg Phe Ser Leu Asp Thr Val Leu Thr Thr Asn Asp
180 185 190

Phe Tyr Gly Phe Gln Trp Thr Asp Thr Tyr Val Asp Ile Tyr Leu Gly
195 200 205

Gly Thr Ile Thr Lys Val Trp Val Asp Asn Asp Trp Ser Ile Val Glu
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210

215

220

Ala Ser Ile Ser Tyr His Trp Asn Arg Ile Asn Tyr Gly Tyr Tyr Met
 225 230 235 240

Gln Phe Val Asn Arg Thr Thr Tyr Tyr Ala Tyr Asn Asn Thr Gly Gly
 245 250 255

Ala Asn Tyr Thr Gln Leu Gln Leu Ser Glu Cys His Thr Asp Tyr Cys
 260 265 270

Ala Gly Tyr Ala Lys Asn Val Phe Val Pro Ile Asp Gly Lys Ile Pro
 275 280 285

Glu Asp Phe Ser Phe Ser Asn Trp Phe Leu Leu Ser Asp Lys Ser Thr
 290 295 300

Leu Val Gln Gly Arg Val Leu Ser Ser Gln Pro Val Phe Val Gln Cys
 305 310 315 320

Leu Arg Pro Val Pro Ser Trp Ser Asn Asn Thr Ala Val Val His Phe
 325 330 335

Lys Asn Asp Ala Phe Cys Pro Asn Val Thr Ala Asp Val Leu Arg Phe
 340 345 350

Asn Leu Asn Phe Ser Asp Thr Asp Val Tyr Thr Asp Ser Thr Asn Asp
 355 360 365

Glu Gln Leu Phe Phe Thr Phe Glu Asp Asn Thr Thr Ala Ser Ile Ala
 370 375 380

Cys Tyr Ser Ser Ala Asn Val Thr Asp Phe Gln Pro Ala Asn Asn Ser
 385 390 395 400

Val Ser His Ile Pro Phe Gly Lys Thr Ala His Phe Cys Phe Ala Asn
 405 410 415

Phe Ser His Ser Ile Val Ser Arg Gln Phe Leu Gly Ile Leu Pro Pro
 420 425 430

Thr Val Arg Glu Phe Ala Phe Gly Arg Asp Gly Ser Ile Phe Val Asn
 435 440 445

Gly Tyr Lys Tyr Phe Ser Leu Pro Ala Ile Arg Ser Val Asn Phe Ser
 450 455 460

Ile ser ser val Glu Glu Tyr Gly Phe Trp Thr Ile Ala Tyr Thr Asn
465 470 475 480

Tyr Thr Asp val Met val Asp val Asn Gly Thr Ala Ile Thr Arg Leu
485 490 495

Phe Tyr Cys Asp Ser Pro Leu Asn Arg Ile Lys Cys Gln Gln Leu Lys
500 505 510

His Glu Leu Pro Asp Gly Phe Tyr Ser Ala Ser Met Leu val Lys Lys
515 520 525

Asp Leu Pro Lys Thr Phe val Thr Met Pro Gln Phe Tyr His Trp Met
530 535 540

Asn val Thr Leu His val val Leu Asn Asp Thr Glu Lys Lys Tyr Asp
545 550 555 560

Ile Ile Leu Ala Lys Ala Pro Glu Leu Ala Ala Leu Ala Asp val His
565 570 575

Phe Glu Ile Ala Gln Ala Asn Gly Ser val Thr Asn val Thr Ser Leu
580 585 590

Cys val Gln Ala Arg Gln Leu Ala Leu Phe Tyr Lys Tyr Thr Ser Leu
595 600 605

Gln Gly Leu Tyr Thr Tyr Ser Asn Leu val Glu Leu Gln Asn Tyr Asp
610 615 620

Cys Pro Phe Ser Pro Gln Gln Phe Asn Asn Tyr Leu Gln Phe Glu Thr
625 630 635 640

Leu Cys Phe Asp val Asn Pro Ala val Ala Gly Cys Lys Trp Ser Leu
645 650 655

val His Asp val Gln Trp Arg Thr Gln Phe Ala Thr Ile Thr val Ser
660 665 670

Tyr Lys His Gly Ser Met Ile Thr Thr His Ala Lys Gly His Ser Trp
675 680 685

Gly Phe Gln Asp Thr Ser val Leu val Lys Asp Glu Cys Thr Asp Tyr
690 695 700

Asn Ile Tyr Gly Phe Gln Gly Thr Gly Ile Ile Arg Asn Thr Thr Ser
705 710 715 720

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Arg Leu Val Ala Gly Leu Tyr Tyr Thr Ser Ile Ser Gly Asp Leu Leu
725 730 735

Ala Phe Lys Asn Ser Thr Thr Gly Glu Ile Phe Thr Val Val Pro Cys
740 745 750

Asp Leu Thr Ala Gln Val Ala Val Ile Asn Asp Glu Ile Val Gly Ala
755 760 765

Ile Thr Ala Val Asn Gln Thr Asp Leu Phe Glu Phe Val Asn Asn Thr
770 775 780

Gln Ala Arg Arg Ser Arg Ser Ser Thr Pro Asn Phe Val Thr Ser Tyr
785 790 795 800

Thr Met Pro Gln Phe Tyr Tyr Ile Thr Lys Trp Asn Asn Asp Thr Ser
805 810 815

Ser Asn Cys Thr Ser Ala Ile Thr Tyr Ser Ser Phe Ala Ile Cys Asn
820 825 830

Thr Gly Glu Ile Lys Tyr Val Asn Val Thr His Val Glu Ile Val Asp
835 840 845

Asp Ser Ile Gly Val Ile Lys Pro Val Ser Thr Gly Asn Ile Ser Ile
850 855 860

Pro Lys Asn Phe Thr Val Ala Val Gln Ala Glu Tyr Ile Gln Ile Gln
865 870 875 880

Val Lys Pro Val Val Val Asp Cys Ala Thr Tyr Val Cys Asn Gly Asn
885 890 895

Thr His Cys Leu Lys Leu Leu Thr Gln Tyr Thr Ser Ala Cys Gln Thr
900 905 910

Ile Glu Asn Ala Leu Asn Leu Gly Ala Arg Leu Glu Ser Leu Met Leu
915 920 925

Asn Asp Met Ile Thr Val Ser Asp Arg Gly Leu Glu Leu Ala Thr Val
930 935 940

Glu Arg Phe Asn Ala Thr Ala Leu Gly Gly Glu Lys Leu Gly Gly Leu
945 950 955 960

Tyr Phe Asp Gly Leu Ser Ser Leu Leu Pro Pro Lys Ile Gly Lys Arg
965 970 975

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Ser Ala Val Glu Asp Leu Leu Phe Asn Lys Val Val Thr Ser Gly Leu
980 985 990

Gly Thr Val Asp Asp Asp Tyr Lys Lys Cys Ser Ser Gly Thr Asp Val
995 1000 1005

Ala Asp Leu Val Cys Ala Gln Tyr Tyr Asn Gly Ile Met Val Leu
1010 1015 1020

Pro Gly Val Val Asp Gly Asn Lys Met Ser Met Tyr Thr Ala Ser
1025 1030 1035

Leu Ile Gly Gly Met Ala Leu Gly Ser Ile Thr Ser Ala Val Ala
1040 1045 1050

Val Pro Phe Ala Met Gln Val Gln Ala Arg Leu Asn Tyr Val Ala
1055 1060 1065

Leu Gln Thr Asp Val Leu Gln Glu Asn Gln Lys Ile Leu Ala Asn
1070 1075 1080

Ala Phe Asn Asn Ala Ile Gly Asn Ile Thr Leu Ala Leu Gly Lys
1085 1090 1095

Val Ser Asn Ala Ile Thr Thr Thr Ser Asp Gly Phe Asn Ser Met
1100 1105 1110

Ala Ser Ala Leu Thr Lys Ile Gln Ser Val Val Asn Gln Gln Gly
1115 1120 1125

Glu Ala Leu Ser Gln Leu Thr Ser Gln Leu Gln Lys Asn Phe Gln
1130 1135 1140

Ala Ile Ser Ser Ser Ile Ala Glu Ile Tyr Asn Arg Leu Glu Lys
1145 1150 1155

Val Glu Ala Asp Ala Gln Val Asp Arg Leu Ile Thr Gly Arg Leu
1160 1165 1170

Ala Ala Leu Asn Ala Tyr Val Ser Gln Thr Leu Thr Gln Tyr Ala
1175 1180 1185

Glu Val Lys Ala Ser Arg Gln Ile Ala Leu Glu Lys Val Asn Glu
1190 1195 1200

Cys Val Lys Ser Gln Ser Asn Arg Tyr Gly Phe Cys Gly Asn Gly
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1205

Thr	His	Leu	Phe	Ser	Leu	Val	Asn	Ser	Ala	Pro	Glu	Gly	Leu	Leu
	1220					1225					1230			
Phe	Phe	His	Thr	Val	Leu	Leu	Pro	Thr	Glu	Trp	Glu	Glu	Val	Thr
	1235					1240					1245			
Ala	Trp	Ser	Gly	Ile	Cys	Val	Asn	Asp	Thr	Tyr	Ala	Tyr	Val	Leu
	1250					1255					1260			
Lys	Asp	Phe	Asp	His	Ser	Ile	Phe	Ser	Tyr	Asn	Gly	Thr	Tyr	Met
	1265					1270					1275			
Val	Thr	Pro	Arg	Asn	Met	Phe	Gln	Pro	Arg	Lys	Pro	Gln	Met	Ser
	1280					1285					1290			
Asp	Phe	Val	Gln	Ile	Thr	Ser	Cys	Glu	Val	Thr	Phe	Leu	Asn	Met
	1295					1300					1305			
Thr	Tyr	Thr	Thr	Phe	Gln	Glu	Ile	Val	Ile	Asp	Tyr	Ile	Asp	Ile
	1310					1315					1320			
Asn	Lys	Thr	Ile	Ala	Asp	Met	Leu	Glu	Gln	Tyr	Asn	Pro	Asn	Tyr
	1325					1330					1335			
Thr	Thr	Pro	Glu	Leu	Asn	Leu	Leu	Leu	Asp	Ile	Phe	Asn	Gln	Thr
	1340					1345					1350			
Lys	Leu	Asn	Leu	Thr	Ala	Glu	Ile	Asp	Gln	Leu	Glu	Gln	Arg	Ala
	1355					1360					1365			
Asp	Asn	Leu	Thr	Thr	Ile	Ala	His	Glu	Leu	Gln	Gln	Tyr	Ile	Asp
	1370					1375					1380			
Asn	Leu	Asn	Lys	Thr	Leu	Val	Asp	Leu	Asp	Trp	Leu	Asn	Arg	Ile
	1385					1390					1395			
Glu	Thr	Tyr	Val	Lys	Trp	Pro	Trp	Tyr	Val	Trp	Leu	Leu	Ile	Gly
	1400					1405					1410			
Leu	Val	Val	Val	Phe	Cys	Ile	Pro	Leu	Leu	Leu	Phe	Cys	Cys	Leu
	1415					1420					1425			
Ser	Thr	Gly	Phe	Cys	Gly	Cys	Phe	Gly	Cys	Val	Gly	Ser	Cys	Cys
	1430					1435					1440			

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 1445 1450 1455

Glu Lys Val His Ile His
 1460

<210> 57
 <211> 1235
 <212> PRT
 <213> Mouse hepatitis virus

<400> 57

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Ser Ala Pro Ser Ile Ser Thr Glu Ala Val Asp Val Ser Lys Gly Arg
 35 40 45

Gly Thr Tyr Tyr Val Leu Asp Arg Val Tyr Leu Asn Ala Thr Leu Leu
 50 55 60

Leu Thr Gly Tyr Tyr Pro Val Asp Gly Ser Asn Tyr Arg Asn Leu Ala
 65 70 75 80

Leu Thr Gly Thr Asn Thr Leu Ser Leu Thr Trp Phe Lys Pro Pro Phe
 85 90 95

Leu Ser Glu Phe Asn Asp Gly Ile Phe Ala Lys Val Gln Asn Leu Lys
 100 105 110

Thr Asn Thr Pro Thr Gly Ala Thr Ser Tyr Phe Pro Thr Ile Val Ile
 115 120 125

Gly Ser Leu Phe Gly Asn Thr Ser Tyr Thr Val Val Leu Glu Pro Tyr
 130 135 140

Asn Asn Ile Ile Met Ala Ser Val Cys Thr Tyr Thr Ile Cys Gln Leu
 145 150 155 160

Pro Tyr Thr Pro Cys Lys Pro Asn Thr Asn Gly Asn Arg Val Ile Gly
 165 170 175

Phe Trp His Thr Asp Val Lys Pro Pro Ile Cys Leu Leu Lys Arg Asn
 180 185 190

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Phe Thr Phe Asn Val Asn Ala Pro Trp Leu Tyr Phe His Phe Tyr Gln
 195 200 205

Gln Gly Gly Thr Phe Tyr Ala Tyr Tyr Ala Asp Lys Pro Ser Ala Thr
 210 215 220

Thr Phe Leu Phe Ser Val Tyr Ile Gly Asp Ile Leu Thr Gln Tyr Phe
 225 230 235 240

Val Leu Pro Phe Ile Cys Thr Pro Thr Ala Gly Ser Thr Leu Ala Pro
 245 250 255

Leu Tyr Trp Val Thr Pro Leu Leu Lys Arg Gln Tyr Leu Phe Asn Phe
 260 265 270

Asn Glu Lys Gly Val Ile Thr Ser Ala Val Asp Cys Ala Ser Ser Tyr
 275 280 285

Ile Ser Glu Ile Lys Cys Lys Thr Gln Ser Leu Leu Pro Ser Thr Gly
 290 295 300

Val Tyr Asp Leu Ser Gly Tyr Thr Val Gln Pro Val Gly Val Val Tyr
 305 310 315 320

Arg Arg Val Pro Asn Leu Pro Asp Cys Lys Ile Glu Glu Trp Leu Thr
 325 330 335

Ala Lys Ser Val Pro Ser Pro Leu Asn Trp Glu Arg Arg Thr Phe Gln
 340 345 350

Asn Cys Asn Phe Asn Leu Ser Ser Leu Leu Arg Tyr Val Gln Ala Glu
 355 360 365

Ser Leu Ser Cys Asn Asn Ile Asp Ala Ser Lys Val Tyr Gly Met Cys
 370 375 380

Phe Gly Ser Val Ser Val Asp Lys Phe Ala Ile Pro Arg Ser Arg Gln
 385 390 395 400

Ile Asp Leu Gln Ile Gly Asn Ser Gly Phe Leu Gln Thr Ala Asn Tyr
 405 410 415

Lys Ile Asp Thr Ala Ala Thr Ser Cys Gln Leu Tyr Tyr Ser Leu Pro
 420 425 430

Lys Asn Asn Val Thr Ile Asn Asn Tyr Asn Pro Ser Ser Trp Asn Arg
 435 440 445

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Arg Tyr Gly Phe Lys Val Asn Asp Arg Cys Gln Ile Phe Ala Asn Ile
450 455 460

Leu Leu Asn Gly Ile Asn Ser Gly Thr Thr Cys Ser Thr Asp Leu Gln
465 470 475 480

Leu Pro Asn Thr Glu Val Ala Thr Gly Val Cys Val Arg Tyr Asp Leu
485 490 495

Tyr Gly Ile Thr Gly Gln Gly Val Phe Lys Glu Val Lys Ala Asp Tyr
500 505 510

Tyr Asn Ser Trp Gln Ala Leu Leu Tyr Asp Val Asn Gly Asn Leu Asn
515 520 525

Gly Phe Arg Asp Leu Thr Thr Asn Lys Thr Tyr Thr Ile Arg Ser Cys
530 535 540

Tyr Ser Gly Arg Val Ser Ala Ala Tyr His Lys Glu Ala Pro Glu Pro
545 550 555 560

Ala Leu Leu Tyr Arg Asn Ile Asn Cys Ser Tyr Val Phe Thr Asn Asn
565 570 575

Ile Ser Arg Glu Glu Asn Pro Leu Asn Tyr Phe Asp Ser Tyr Leu Gly
580 585 590

Cys Val Val Asn Ala Asp Asn Arg Thr Asp Glu Ala Leu Pro Asn Cys
595 600 605

Asn Leu Arg Met Gly Ala Gly Leu Cys Val Asp Tyr Ser Lys Ser Arg
610 615 620

Arg Ala Arg Arg Ser Val Ser Thr Gly Tyr Arg Leu Thr Thr Phe Glu
625 630 635 640

Pro Tyr Met Pro Met Leu Val Asn Asp Ser Val Gln Ser Val Gly Gly
645 650 655

Leu Tyr Glu Met Gln Ile Pro Thr Asn Phe Thr Ile Gly His His Glu
660 665 670

Glu Phe Ile Gln Ile Arg Ala Pro Lys Val Thr Ile Asp Cys Ala Ala
675 680 685

Phe Val Cys Gly Asp Asn Ala Ala Cys Arg Gln Gln Leu Val Glu Tyr
690 695 700

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Gly Ser Phe Cys Asp Asn Val Asn Ala Ile Leu Asn Glu Val Asn Asn
705 710 715 720

Leu Leu Asp Asn Met Gln Leu Gln Val Ala Ser Ala Leu Met Gln Gly
725 730 735

Val Thr Ile Ser Ser Arg Leu Pro Asp Gly Ile Ser Gly Pro Ile Asp
740 745 750

Asp Ile Asn Phe Ser Pro Leu Leu Gly Cys Ile Gly Ser Thr Cys Ala
755 760 765

Glu Asp Gly Asn Gly Pro Ser Ala Ile Arg Gly Arg Ser Ala Ile Glu
770 775 780

Asp Leu Leu Phe Asp Lys Val Lys Leu Ser Asp Val Gly Phe Val Glu
785 790 795 800

Ala Tyr Asn Asn Cys Thr Gly Gly Gln Glu Val Arg Asp Leu Leu Cys
805 810 815

Val Gln Ser Phe Asn Gly Ile Lys Val Leu Pro Pro Val Leu Ser Glu
820 825 830

Ser Gln Ile Ser Gly Tyr Thr Ala Gly Ala Thr Ala Ala Ala Met Phe
835 840 845

Pro Pro Trp Thr Ala Ala Ala Gly Val Pro Phe Ser Leu Asn Val Gln
850 855 860

Tyr Arg Ile Asn Gly Leu Gly Val Thr Met Asn Val Leu Ser Glu Asn
865 870 875 880

Gln Lys Met Ile Ala Ser Ala Phe Asn Asn Ala Leu Gly Ala Ile Gln
885 890 895

Glu Gly Phe Asp Ala Thr Asn Ser Ala Leu Gly Lys Ile Gln Ser Val
900 905 910

Val Asn Ala Asn Ala Glu Ala Leu Asn Asn Leu Leu Asn Gln Leu Ser
915 920 925

Asn Arg Phe Gly Ala Ile Ser Ala Ser Leu Gln Glu Ile Leu Thr Arg
930 935 940

Leu Asp Ala Val Glu Ala Lys Ala Gln Ile Asp Arg Leu Ile Asn Gly

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945 950 955 960

Arg Leu Thr Ala Leu Asn Ala Tyr Ile Ser Lys Gln Leu Ser Asp Ser
965 970 975

Thr Leu Ile Lys Phe Ser¹¹ Ala Ala Gln Ala Ile Glu Lys Val Asn Glu
980 985 990

Cys Val Lys Ser Gln Thr Thr Arg Ile Asn Phe Cys Gly Asn Gly Asn
995 1000 1005

His Ile Leu Ser Leu Val Gln Asn Ala Pro Tyr Gly Leu Cys Phe
1010 1015 1020

Ile His Phe Ser Tyr Val Pro Thr Ser Phe Lys Thr Ala Asn Val
1025 1030 1035

Ser Pro Gly Leu Cys Ile Ser Gly Asp Arg Gly Leu Ala Pro Lys
1040 1045 1050

Ala Gly Tyr Phe Val Gln Asp Asn Gly Glu Trp Lys Phe Thr Gly
1055 1060 1065

Ser Asn Tyr Tyr Tyr Pro Glu Pro Ile Thr Asp Lys Asn Ser Val
1070 1075 1080

Ala Met Ile Ser Cys Ala Val Asn Tyr Thr Lys Ala Pro Glu Val
1085 1090 1095

Phe Leu Asn Asn Ser Ile Pro Asn Leu Pro Asp Phe Lys Glu Glu
1100 1105 1110

Leu Asp Lys Trp Phe Lys Asn Gln Thr Ser Ile Ala Pro Asp Leu
1115 1120 1125

Ser Leu Asp Phe Glu Lys Leu Asn Val Thr Phe Leu Asp Leu Thr
1130 1135 1140

Tyr Glu Met Asn Arg Ile Gln Asp Ala Ile Lys Lys Leu Asn Glu
1145 1150 1155

Ser Tyr Ile Asn Leu Lys Glu Val Gly Thr Tyr Glu Met Tyr Val
1160 1165 1170

Lys Trp Pro Trp Tyr Val Trp Leu Leu Ile Gly Leu Ala Gly Val
1175 1180 1185

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Ala Val Cys Val Leu Leu Phe Phe Ile Cys Cys Cys Thr Gly Cys
1190 1195 1200

Gly Ser Cys Cys Phe Arg Lys Cys Gly Ser Cys Cys Asp Glu Tyr
1205 1210 1215

Gly Gly His Gln Asp Ser Ile Val Ile His Asn Ile Ser Ala His
1220 1225 1230

Glu Asp
1235

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<212> PRT
<213> human coronavirus

<400> 58

Met Phe Leu Ile Leu Leu Ile Ser Leu Pro Met Ala Leu Ala Val Ile
1 5 10 15

Gly Asp Leu Lys Cys Thr Thr Val Ala Ile Asn Asp Val Asp Thr Gly
20 25 30

Val Pro Ser Thr Ser Thr Asp Ile Val Asp Val Thr Asn Gly Leu Gly
35 40 45

Thr Tyr Tyr Val Leu Asp Arg Val Tyr Leu Asn Thr Thr Leu Leu Leu
50 55 60

Asn Gly Tyr Tyr Pro Thr Ser Gly Ser Thr Tyr Arg Asn Met Ala Leu
65 70 75 80

Lys Gly Thr Leu Leu Leu Ser Arg Leu Trp Phe Lys Pro Pro Phe Leu
85 90 95

Ser Asp Phe Ile Asn Gly Ile Phe Ala Lys Val Lys Asn Thr Lys Val
100 105 110

Ile Lys His Gly Val Met Tyr Ser Glu Phe Pro Ala Ile Thr Ile Gly
115 120 125

Ser Thr Phe Val Asn Thr Ser Tyr Ser Val Val Val Gln Pro His Thr
130 135 140

Thr Asn Leu Asp Asn Lys Leu Gln Gly Leu Leu Glu Ile Ser Val Cys
145 150 155 160

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Gln Tyr Thr Met Cys Glu Tyr Pro Asn Thr Ile Cys His Pro Asn Leu
 165 170 175

Gly Asn Arg Arg Val Glu Leu Trp His Trp Asp Thr Gly Val Val Ser
 180 185 190

Cys Leu Tyr Lys Arg Asn Phe Thr Tyr Asp Val Asn Ala Asp Tyr Leu
 195 200 205

Tyr Phe His Phe Tyr Gln Glu Gly Gly Ile Phe Tyr Ala Tyr Phe Thr
 210 215 220

Asp Thr Gly Val Val Thr Lys Phe Leu Phe Asn Val Tyr Leu Gly Thr
 225 230 235 240

Val Leu Ser Tyr Tyr Tyr Val Met Pro Leu Thr Cys Asn Ser Ala Met
 245 250 255

Thr Leu Glu Tyr Trp Val Thr Pro Leu Thr Ser Lys Gln Tyr Leu Leu
 260 265 270

Ala Phe Asn Gln Asp Gly Val Ile Phe Asn Ala Val Asp Cys Lys Ser
 275 280 285

Asp Phe Met Ser Glu Ile Lys Cys Lys Thr Leu Ser Ile Ala Pro Ser
 290 295 300

Thr Gly Val Tyr Glu Leu Asn Gly Tyr Thr Val Gln Pro Ile Ala Asp
 305 310 315 320

Val Tyr Arg Arg Ile Pro Asn Leu Pro Asp Cys Asn Ile Glu Ala Trp
 325 330 335

Leu Asn Asp Lys Ser Val Pro Ser Pro Leu Asn Trp Glu Arg Lys Thr
 340 345 350

Phe Ser Asn Cys Asn Phe Asn Met Ser Ser Leu Met Ser Phe Ile Gln
 355 360 365

Ala Asp Ser Phe Thr Cys Asn Asn Ile Asp Ala Ala Lys Ile Tyr Gly
 370 375 380

Met Cys Phe Ser Ser Ile Thr Ile Asp Lys Phe Ala Ile Pro Asn Gly
 385 390 395 400

Arg Lys Val Asp Leu Gln Leu Gly Asn Leu Gly Tyr Leu Gln Ser Phe
 405 410 415

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Asn Tyr Arg Ile Asp Thr Thr Ala Thr Ser Cys Gln Leu Tyr Tyr Asn
420 425 430

Leu Pro Ala Ala Asn Val Ser Val Ser Arg Phe Asn Pro Ser Ile Trp
435 440 445

Asn Arg Arg Phe Gly Phe Thr Glu Gln Ser Val Phe Lys Pro Gln Pro
450 455 460

Ala Gly Val Phe Thr Asp His Asp Val Val Tyr Ala Gln His Cys Phe
465 470 475 480

Lys Ala Pro Thr Asn Phe Cys Pro Cys Lys Leu Asp Gly Ser Leu Cys
485 490 495

Val Gly Asn Gly Pro Gly Ile Asp Ala Gly Tyr Lys Asn Ser Gly Ile
500 505 510

Gly Thr Cys Pro Ala Gly Thr Asn Tyr Leu Thr Cys His Asn Ala Val
515 520 525

Gln Cys Asn Cys Leu Cys Thr Pro Asp Pro Ile Thr Ser Lys Ser Thr
530 535 540

Gly Pro Tyr Lys Cys Pro Gln Thr Lys Tyr Leu Val Gly Ile Gly Glu
545 550 555 560

His Cys Ser Gly Leu Ala Ile Lys Ser Asp Tyr Cys Gly Gly Asn Pro
565 570 575

Cys Thr Cys Gln Pro Gln Ala Phe Leu Gly Trp Ser Val Asp Ser Cys
580 585 590

Leu Gln Gly Asp Arg Cys Asn Ile Phe Ala Asn Phe Ile Leu His Asp
595 600 605

Val Asn Ser Gly Thr Thr Cys Ser Thr Asp Leu Gln Lys Ser Asn Thr
610 615 620

Asp Ile Ile Leu Gly Val Cys Val Asn Tyr Asp Leu Tyr Gly Ile Thr
625 630 635 640

Gly Gln Gly Ile Phe Val Glu Val Asn Ala Pro Tyr Tyr Asn Ser Trp
645 650 655

Gln Asn Leu Leu Tyr Asp Ser Asn Gly Asn Leu Tyr Gly Phe Arg Asp
660 665 670

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Tyr Leu Thr Asn Arg Thr Phe Met Ile Arg Ser Cys Tyr Ser Gly Arg
675 680 685

Val Ser Ala Ala Phe His Ala Asn Ser Ser Glu Pro Ala Leu Leu Phe
690 695 700

Arg Asn Ile Lys Cys Asn Tyr Val Phe Asn Asn Thr Leu Ser Arg Gln
705 710 715 720

Leu Gln Pro Ile Asn Tyr Phe Asp Ser Tyr Leu Gly Cys Val Val Asn
725 730 735

Ala Asp Asn Ser Thr Ala Ser Ala Val Gln Thr Cys Asp Leu Thr Val
740 745 750

Gly Ser Gly Tyr Cys Val Asp Tyr Ser Thr Lys Arg Arg Ser Arg Arg
755 760 765

Ala Ile Thr Thr Gly Tyr Arg Phe Thr Asn Phe Glu Pro Phe Thr Val
770 775 780

Asn Ser Val Asn Asp Ser Leu Glu His Val Gly Gly Leu Tyr Glu Ile
785 790 795 800

Gln Ile Pro Ser Glu Phe Thr Ile Gly Asn Met Glu Glu Phe Ile Gln
805 810 815

Thr Ser Ser Pro Lys Val Thr Ile Asp Cys Ser Ala Phe Val Cys Gly
820 825 830

Asp Cys Ala Ala Cys Lys Ser Gln Leu Val Glu Tyr Gly Ser Phe Cys
835 840 845

Asp Asn Ile Asn Ala Ile Leu Thr Glu Val Asn Glu Leu Leu Asp Thr
850 855 860

Thr Gln Leu Gln Val Ala Asn Ser Leu Met Asn Gly Val Thr Leu Ser
865 870 875 880

Thr Lys Leu Lys Asp Gly Val Asn Phe Asn Val Asp Asp Val Asn Phe
885 890 895

Ser Pro Val Leu Gly Cys Leu Gly Ser Glu Cys Asn Lys Val Ser Ser
900 905 910

Arg Ser Ala Ile Glu Asp Leu Leu Phe Ser Lys Val Arg Leu Ser Asp

915

Val Gly Phe Val Glu Ala Tyr Asn Asn Cys Thr Gly Gly Ala Gly Ile
930 935 940

Arg Asp Leu Ile Cys Val Gln Ser Tyr Asn Gly Ile Lys Val Leu Pro
945 950 955 960

Pro Leu Leu Ser Asp Asn Gln Ile Ser Gly Tyr Thr Leu Ala Ala Thr
965 970 975

Ser Ala Asn Leu Phe Pro Pro Trp Ser Ala Ala Ala Gly Val Pro Phe
980 985 990

Tyr Leu Asn Val Gln Tyr Arg Ile Asn Gly Ile Gly Val Thr Met Asp
995 1000 1005

Val Leu Ser Gln Asn Gln Lys Leu Ile Ala Asn Ala Phe Asn Asn
1010 1015 1020

Ala Leu Asp Ala Ile Gln Glu Gly Phe Asp Ala Thr Asn Ser Ala
1025 1030 1035

Leu Val Lys Ile Gln Ala Val Val Asn Ala Asp Ala Glu Ala Leu
1040 1045 1050

Asn Asn Leu Leu Gln Gln Leu Ser Asn Arg Phe Gly Ala Ile Ser
1055 1060 1065

Ser Ser Leu Gln Glu Ile Leu Ser Arg Leu Asp Ala Leu Glu Ala
1070 1075 1080

Gln Ala Gln Ile Asp Arg Leu Ile Asn Gly Arg Leu Thr Ala Leu
1085 1090 1095

Asp Ala Tyr Val Ser Gln Gln Leu Ser Asp Ser Thr Leu Val Lys
1100 1105 1110

Phe Ser Ala Ala Gln Ala Met Glu Lys Val Asn Glu Cys Val Lys
1115 1120 1125

Ser Gln Ser Ser Arg Ile Asn Phe Cys Gly Asn Gly Asn His Ile
1130 1135 1140

Ile Ser Leu Val Gln Asn Ala Pro Tyr Gly Leu Tyr Phe Ile His
1145 1150 1155

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Phe Ser Tyr Val Pro Thr Lys Tyr Val Thr Ala Lys Val Ser Pro
 1160 1165 1170

Gly Leu Cys Ile Ala Gly Asp Arg Gly Ile Ala Pro Lys Ser Gly
 1175 1180 1185

Tyr Phe Val Asn Val Asn Asn Thr Trp Met Phe Thr Gly Ser Arg
 1190 1195 1200

Tyr Tyr Tyr Pro Glu Pro Ile Thr Gly Asn Asn Val Val Val Met
 1205 1210 1215

Ser Thr Cys Ala Val Asn Tyr Thr Lys Ala Pro Asp Val Met Leu
 1220 1225 1230

Asn Ile Ser Thr Pro Asn Leu Pro Asp Phe Lys Glu Glu Leu Asp
 1235 1240 1245

Gln Trp Phe Lys Asn Gln Thr Leu Val Ala Pro Asp Leu Ser Leu
 1250 1255 1260

Asp Tyr Ile Asn Val Thr Phe Leu Asp Leu Gln Asp Glu Met Asn
 1265 1270 1275

Arg Leu Gln Glu Ala Ile Lys Val Leu Asn Gln Ser Tyr Ile Asn
 1280 1285 1290

Leu Lys Asp Ile Gly Thr Tyr Glu Tyr Tyr Val Lys Trp Pro Trp
 1295 1300 1305

Tyr Val Trp Leu Leu Ile Gly Phe Ala Gly Val Ala Met Leu Val
 1310 1315 1320

Leu Leu Phe Phe Ile Cys Cys Cys Thr Gly Cys Gly Thr Ser Cys
 1325 1330 1335

Phe Lys Lys Cys Gly Gly Cys Cys Asp Asp Tyr Thr Gly His Gln
 1340 1345 1350

Glu Leu Val Ile Lys Thr Ser His Glu Gly
 1355 1360

<210> 59

<211> 1383

<212> PRT

<213> Porcine epidemic diarrhea virus

<400> 59

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Met Arg Ser Leu Ile Tyr Phe Trp Leu Leu Leu Pro Val Leu Pro Thr
 1 5 10 15
 Leu Ser Leu Pro Gln Asp Val Thr Arg Cys Gln Ser Thr Thr Asn Phe
 20 25 30
 Arg Arg Phe Phe Ser Lys Phe Asn Val Gln Ala Pro Ala Val Val Val
 35 40 45
 Leu Gly Gly Tyr Leu Pro Ser Met Asn Ser Ser Ser Trp Tyr Cys Gly
 50 55 60
 Thr Gly Ile Glu Thr Ala Ser Gly Val His Gly Ile Phe Leu Ser Tyr
 65 70 75 80
 Ile Asp Ser Gly Gln Gly Phe Glu Ile Gly Ile Ser Gln Glu Pro Phe
 85 90 95
 Asp Pro Ser Gly Tyr Gln Leu Tyr Leu His Lys Ala Thr Asn Gly Asn
 100 105 110
 Thr Asn Ala Thr Ala Arg Leu Arg Ile Cys Gln Phe Pro Asp Asn Lys
 115 120 125
 Thr Leu Gly Pro Thr Val Asn Asp Val Thr Thr Gly Arg Asn Cys Leu
 130 135 140
 Phe Asn Lys Ala Ile Pro Ala Tyr Met Arg Asp Gly Lys Asp Ile Val
 145 150 155 160
 Val Gly Ile Thr Trp Asp Asn Asp Arg Val Thr Val Phe Ala Asp Lys
 165 170 175
 Ile Tyr His Phe Tyr Leu Lys Asn Asp Trp Ser Arg Val Ala Thr Arg
 180 185 190
 Cys Tyr Asn Arg Arg Ser Cys Ala Met Gln Tyr Val Tyr Thr Pro Thr
 195 200 205
 Tyr Tyr Met Leu Asn Val Thr Ser Ala Gly Glu Asp Gly Ile Tyr Tyr
 210 215 220
 Glu Pro Cys Thr Ala Asn Cys Thr Gly Tyr Ala Ala Asn Val Phe Ala
 225 230 235 240
 Thr Asp Ser Asn Gly His Ile Pro Glu Gly Phe Ser Phe Asn Asn Trp
 245 250 255

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Phe Leu Leu Ser Asn Asp Ser Thr Leu Leu His Gly Lys Val Val Ser
260 265 270

Asn Gln Pro Leu Leu Val Asn Cys Leu Leu Ala Ile Pro Lys Ile Tyr
275 280 285

Gly Leu Gly Gln Phe Phe Ser Phe Asn His Thr Met Asp Gly Val Cys
290 295 300

Asn Gly Ala Ala Val Asp Arg Ala Pro Glu Ala Leu Arg Phe Asn Ile
305 310 315 320

Asn Asp Thr Ser Val Ile Leu Ala Glu Gly Ser Ile Val Leu His Thr
325 330 335

Ala Leu Gly Thr Asn Leu Ser Phe Val Cys Ser Asn Ser Ser Asp Pro
340 345 350

His Leu Ala Ile Phe Ala Ile Pro Leu Gly Ala Thr Glu Val Pro Tyr
355 360 365

Tyr Cys Phe Leu Lys Val Asp Thr Tyr Asn Ser Thr Val Tyr Lys Phe
370 375 380

Leu Ala Val Leu Pro Ser Thr Val Arg Glu Ile Val Ile Thr Lys Tyr
385 390 395 400

Gly Asp Val Tyr Val Asn Gly Phe Gly Tyr Leu His Leu Gly Leu Leu
405 410 415

Asp Ala Val Thr Ile Tyr Phe Thr Gly His Gly Thr Asp Asp Asp Val
420 425 430

Ser Gly Phe Trp Thr Ile Ala Ser Thr Asn Phe Val Asp Ala Leu Ile
435 440 445

Glu Val Gln Gly Thr Ser Ile Gln Arg Ile Leu Tyr Cys Asp Asp Pro
450 455 460

Val Ser Gln Leu Lys Cys Ser Gln Val Ala Phe Asp Leu Asp Asp Gly
465 470 475 480

Phe Tyr Pro Ile Ser Ser Arg Asn Leu Leu Ser His Glu Gln Pro Ile
485 490 495

Ser Phe Val Thr Leu Pro Ser Phe Asn Asp His Ser Phe Val Asn Ile
500 505 510

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Thr Val Ser Ala Ala Phe Gly Gly Leu Ser Ser Ala Asn Leu Val Ala
515 520 525

Ser Asp Thr Thr Ile Asn Gly Phe Ser Ser Phe Cys Val Asp Thr Arg
530 535 540

Gln Phe Thr Ile Thr Leu Phe Tyr Asn Val Thr Asn Ser Tyr Gly Tyr
545 550 555 560

Val Ser Lys Ser Gln Asp Ser Asn Cys Pro Phe Thr Leu Gln Ser Val
565 570 575

Asn Asp Tyr Leu Ser Phe Ser Lys Phe Cys Val Ser Thr Ser Leu Leu
580 585 590

Ala Gly Ala Cys Thr Ile Asp Leu Phe Gly Tyr Pro Ala Phe Gly Ser
595 600 605

Gly Val Lys Leu Thr Ser Leu Tyr Phe Gln Phe Thr Lys Gly Glu Leu
610 615 620

Ile Thr Gly Thr Pro Lys Pro Leu Glu Gly Ile Thr Asp Val Ser Phe
625 630 635 640

Met Thr Leu Asp Val Cys Thr Lys Tyr Thr Ile Tyr Gly Phe Lys Gly
645 650 655

Glu Gly Ile Ile Thr Leu Thr Asn Ser Ser Ile Leu Ala Gly Val Tyr
660 665 670

Tyr Thr Ser Asp Ser Gly Gln Leu Leu Ala Phe Lys Asn Val Thr Ser
675 680 685

Gly Ala Val Tyr Ser Val Thr Pro Cys Ser Phe Ser Glu Gln Ala Ala
690 695 700

Tyr Val Asn Asp Asp Ile Val Gly Val Ile Ser Ser Leu Ser Asn Ser
705 710 715 720

Thr Phe Asn Asn Thr Arg Glu Leu Pro Gly Phe Phe Tyr His Ser Asn
725 730 735

Asp Gly Ser Asn Cys Thr Glu Pro Val Leu Val Tyr Ser Asn Ile Gly
740 745 750

Val Cys Lys Ser Gly Ser Ile Gly Tyr Val Pro Ser Gln Tyr Gly Gln
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755

Val Lys Ile Ala Pro Thr Val Thr Gly Asn Ile Ser Ile Pro Thr Asn
770 775 780

Phe Ser Met Ser Ile Arg Thr Glu Tyr Leu Gln Leu Tyr Asn Thr Pro
785 790 795 800

Val Ser Val Asp Cys Ala Thr Tyr Val Cys Asn Gly Asn Ser Arg Cys
805 810 815

Lys Gln Leu Leu Thr Gln Tyr Thr Ala Ala Cys Lys Thr Ile Glu Ser
820 825 830

Ala Leu Gln Leu Ser Ala Arg Leu Glu Ser Val Glu Val Asn Ser Met
835 840 845

Leu Thr Ile Ser Glu Glu Ala Leu Gln Leu Ala Thr Ile Ser Ser Phe
850 855 860

Asn Gly Asp Gly Tyr Asn Phe Thr Asn Val Leu Gly Ala Ser Val Tyr
865 870 875 880

Asp Pro Ala Ser Gly Arg Val Val Gln Lys Arg Ser Val Ile Glu Asp
885 890 895

Leu Leu Phe Asn Lys Val Val Thr Asn Gly Leu Gly Thr Val Asp Glu
900 905 910

Asp Tyr Lys Arg Cys Ser Asn Gly Arg Ser Val Ala Asp Leu Val Cys
915 920 925

Ala Gln Tyr Tyr Ser Gly Val Met Val Leu Pro Gly Val Val Asp Ala
930 935 940

Glu Lys Leu His Met Tyr Ser Ala Ser Leu Ile Gly Gly Met Ala Leu
945 950 955 960

Gly Gly Ile Thr Ala Ala Ala Ala Leu Pro Phe Ser Tyr Ala Val Gln
965 970 975

Ala Arg Leu Asn Tyr Leu Ala Leu Gln Thr Asp Val Leu Gln Arg Asn
980 985 990

Gln Gln Leu Leu Ala Glu Ser Phe Asn Ser Ala Ile Gly Asn Ile Thr
995 1000 1005

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Ser Ala Phe Glu Ser Val Lys Glu Ala Ile Ser Gln Thr Ser Lys
 1010 1015 1020
 Gly Leu Asn Thr Val Ala His Ala Leu Thr Lys Val Gln Glu Val
 1025 1030 1035
 Val Asn Ser Gln Gly Ser Ala Leu Asn Gln Leu Thr Val Gln Leu
 1040 1045 1050
 Gln His Asn Phe Gln Ala Ile Ser Ser Ser Ile Asp Asp Ile Tyr
 1055 1060 1065
 Ser Arg Leu Asp Ile Leu Leu Ala Asp Val Gln Val Asp Arg Leu
 1070 1075 1080
 Ile Thr Gly Arg Leu Ser Ala Leu Asn Ala Phe Val Ala Gln Thr
 1085 1090 1095
 Leu Thr Lys Tyr Thr Glu Val Gln Ala Ser Arg Lys Leu Ala Gln
 1100 1105 1110
 Gln Lys Val Asn Glu Cys Val Lys Ser Gln Ser Gln Arg Tyr Gly
 1115 1120 1125
 Phe Cys Gly Gly Asp Gly Glu His Ile Phe Ser Leu Val Gln Ala
 1130 1135 1140
 Ala Pro Gln Gly Leu Leu Phe Leu His Thr Val Leu Val Pro Gly
 1145 1150 1155
 Asp Phe Val Asn Val Leu Ala Ile Ala Gly Leu Cys Val Asn Gly
 1160 1165 1170
 Glu Ile Ala Leu Thr Leu Arg Glu Pro Gly Leu Val Leu Phe Thr
 1175 1180 1185
 His Glu Leu Gln Thr Tyr Thr Ala Thr Glu Tyr Phe Val Ser Ser
 1190 1195 1200
 Arg Arg Met Phe Glu Pro Arg Lys Pro Thr Val Ser Asp Phe Val
 1205 1210 1215
 Gln Ile Glu Ser Cys Val Val Thr Tyr Val Asn Leu Thr Ser Asp
 1220 1225 1230
 Gln Leu Pro Asp Val Ile Pro Asp Tyr Ile Asp Val Asn Lys Thr
 1235 1240 1245

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Leu Asp Glu Ile Leu Ala Ser Leu Pro Asn Arg Thr Gly Pro Ser
1250 1255 1260

Leu Pro Leu Asp Val Phe Asn Ala Thr Tyr Leu Asn Leu Thr Gly
1265 1270 1275

Glu Ile Ala Asp Leu Glu Gln Arg Ser Glu Ser Leu Arg Asn Thr
1280 1285 1290

Thr Glu Glu Leu Arg Ser Leu Ile Asn Asn Ile Asn Asn Thr Leu
1295 1300 1305

Val Asp Leu Glu Trp Leu Asn Arg Val Glu Thr Tyr Ile Lys Trp
1310 1315 1320

Pro Trp Trp Val Trp Leu Ile Ile Val Ile Val Leu Ile Phe Val
1325 1330 1335

Val Ser Leu Leu Val Phe Cys Cys Ile Ser Thr Gly Cys Cys Gly
1340 1345 1350

Cys Cys Gly Cys Cys Gly Ala Cys Phe Ser Gly Cys Cys Arg Gly
1355 1360 1365

Pro Arg Leu Gln Pro Tyr Glu Ala Phe Glu Lys Val His Val Gln
1370 1375 1380

<210> 60
<211> 1349
<212> PRT
<213> porcine hemagglutinating encephalomyelitis virus

<400> 60

Met Phe Phe Ile Leu Leu Ile Ser Leu Pro Ser Ala Phe Ala Val Ile
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Gly Asp Leu Lys Cys Thr Thr Ser Leu Ile Asn Asp Val Asp Thr Gly
20 25 30

Val Pro Ser Ile Ser Ser Glu Val Val Asp Val Thr Asn Gly Leu Gly
35 40 45

Thr Phe Tyr Val Leu Asp Arg Val Tyr Leu Asn Thr Thr Leu Leu Leu
50 55 60

Asn Gly Tyr Tyr Pro Ile Ser Gly Ala Thr Phe Arg Asn Met Ala Leu
65 70 75 80

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Lys Gly Thr Arg Leu Leu Ser Thr Leu Trp Phe Lys Pro Pro Phe Leu
 85 90 95
 Ser Pro Phe Asn Asp Gly Ile Phe Ala Lys Val Lys Asn Ser Arg Phe
 100 105 110
 Ser Lys Asp Gly Val Ile Tyr Ser Glu Phe Pro Ala Ile Thr Ile Gly
 115 120 125
 Ser Thr Phe Val Asn Thr Ser Tyr Ser Ile Val Val Glu Pro His Thr
 130 135 140
 Ser Leu Ile Asn Gly Asn Leu Gln Gly Leu Leu Gln Ile Ser Val Cys
 145 150 155 160
 Gln Tyr Thr Met Cys Glu Tyr Pro His Thr Ile Cys His Pro Asn Leu
 165 170 175
 Gly Asn Gln Arg Ile Glu Leu Trp His Tyr Asp Thr Asp Val Val Ser
 180 185 190
 Cys Leu Tyr Arg Arg Asn Phe Thr Tyr Asp Val Asn Ala Asp Tyr Leu
 195 200 205
 Tyr Phe His Phe Tyr Gln Glu Gly Gly Thr Phe Tyr Ala Tyr Phe Thr
 210 215 220
 Asp Thr Gly Phe Val Thr Lys Phe Leu Phe Lys Leu Tyr Leu Gly Thr
 225 230 235 240
 Val Leu Ser His Tyr Tyr Val Met Pro Leu Thr Cys Asn Ser Ala Leu
 245 250 255
 Ser Leu Glu Tyr Trp Val Thr Pro Leu Thr Thr Arg Gln Phe Leu Leu
 260 265 270
 Ala Phe Asp Gln Asp Gly Val Leu Tyr His Ala Val Asp Cys Ala Ser
 275 280 285
 Asp Phe Met Ser Glu Ile Met Cys Lys Thr Ser Ser Ile Thr Pro Pro
 290 295 300
 Thr Gly Val Tyr Glu Leu Asn Gly Tyr Thr Val Gln Pro Val Ala Thr
 305 310 315 320
 Val Tyr Arg Arg Ile Pro Asp Leu Pro Asn Cys Asp Ile Glu Ala Trp
 325 330 335

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Leu Asn Ser Lys Thr Val Ser Ser Pro Leu Asn Trp Glu Arg Lys Ile
340 345 350

Phe Ser Asn Cys Asn Phe Asn Met Gly Arg Leu Met Ser Phe Ile Gln
355 360 365

Ala Asp Ser Phe Gly Cys Asn Asn Ile Asp Ala Ser Arg Leu Tyr Gly
370 375 380

Met Cys Phe Gly Ser Ile Thr Ile Asp Lys Phe Ala Ile Pro Asn Ser
385 390 395 400

Arg Lys Val Asp Leu Gln Val Gly Lys Ser Gly Tyr Leu Gln Ser Phe
405 410 415

Asn Tyr Lys Ile Asp Thr Ala Val Ser Ser Cys Gln Leu Tyr Tyr Ser
420 425 430

Leu Pro Ala Ala Asn Val Ser Val Thr His Tyr Asn Pro Ser Ser Trp
435 440 445

Asn Arg Arg Tyr Gly Phe Asn Asn Gln Ser Phe Gly Ser Arg Gly Leu
450 455 460

His Asp Ala Val Tyr Ser Gln Gln Cys Phe Asn Thr Pro Asn Thr Tyr
465 470 475 480

Cys Pro Cys Arg Thr Ser Gln Cys Ile Gly Gly Ala Gly Thr Gly Thr
485 490 495

Cys Pro Val Gly Thr Thr Val Arg Lys Cys Phe Ala Ala Val Thr Lys
500 505 510

Ala Thr Lys Cys Thr Cys Trp Cys Gln Pro Asp Pro Ser Thr Tyr Lys
515 520 525

Gly Val Asn Ala Trp Thr Cys Pro Gln Ser Lys Val Ser Ile Gln Pro
530 535 540

Gly Gln His Cys Pro Gly Leu Gly Leu Val Glu Asp Asp Cys Ser Gly
545 550 555 560

Asn Pro Cys Thr Cys Lys Pro Gln Ala Phe Ile Gly Trp Ser Ser Glu
565 570 575

Thr Cys Leu Gln Asn Gly Arg Cys Asn Ile Phe Ala Asn Phe Ile Leu
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580

585

590

Asn Asp Val Asn Ser Gly Thr Thr Cys Ser Thr Asp Leu Gln Gln Gly
595 600 605

Asn Thr Ile Ile Thr Thr Asp Val Cys Val Asn Tyr Asp Leu Tyr Gly
610 615 620

Ile Thr Gly Gln Gly Ile Leu Ile Glu Val Asn Ala Thr Tyr Tyr Asn
625 630 635 640

Ser Trp Gln Asn Leu Leu Tyr Asp Ser Ser Gly Asn Leu Tyr Gly Phe
645 650 655

Arg Asp Tyr Leu Ser Asn Arg Thr Phe Leu Ile Arg Ser Cys Tyr Ser
660 665 670

Gly Arg Val Ser Ala Val Phe His Ala Asn Ser Ser Glu Pro Ala Leu
675 680 685

Met Phe Arg Asn Leu Lys Cys Ser His Val Phe Asn Asn Thr Ile Leu
690 695 700

Arg Gln Ile Gln Leu Val Asn Tyr Phe Asp Ser Tyr Leu Gly Cys Val
705 710 715 720

Val Asn Ala Tyr Asn Asn Thr Ala Ser Ala Val Ser Thr Cys Asp Leu
725 730 735

Thr Val Gly Ser Gly Tyr Cys Val Asp Tyr Val Thr Ala Leu Arg Ser
740 745 750

Arg Arg Ser Phe Thr Thr Gly Tyr Arg Phe Thr Asn Phe Glu Pro Phe
755 760 765

Ala Ala Asn Leu Val Asn Asp Ser Ile Glu Pro Val Gly Gly Leu Tyr
770 775 780

Glu Ile Gln Ile Pro Ser Glu Phe Thr Ile Gly Asn Leu Glu Glu Phe
785 790 795 800

Ile Gln Thr Arg Ser Pro Lys Val Thr Ile Asp Cys Ala Thr Phe Val
805 810 815

Cys Gly Asp Tyr Ala Ala Cys Arg Gln Gln Leu Ala Glu Tyr Gly Ser
820 825 830

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Phe Cys Glu Asn Ile Asn Ala Ile Leu Thr Glu Val Asn Glu Leu Leu
835 840 845

Asp Thr Thr Gln Leu Gln Val Ala Asn Ser Leu Met Asn Gly Val Thr
850 855 860

Leu Ser Thr Lys Ile Lys Asp Gly Ile Asn Phe Asn Val Asp Asp Ile
865 870 875 880

Asn Phe Ser Pro Val Leu Gly Cys Leu Gly Ser Glu Cys Asn Arg Ala
885 890 895

Ser Thr Arg Ser Ala Ile Glu Asp Leu Leu Phe Asp Lys Val Lys Leu
900 905 910

Ser Asp Val Gly Phe Val Gln Ala Tyr Asn Asn Cys Thr Gly Gly Ala
915 920 925

Glu Ile Arg Asp Leu Ile Cys Val Gln Ser Tyr Asn Gly Ile Lys Val
930 935 940

Leu Pro Pro Leu Leu Ser Glu Asn Gln Ile Ser Gly Tyr Thr Leu Ala
945 950 955 960

Ala Thr Ala Ala Ser Leu Phe Pro Pro Trp Thr Ala Ala Ala Gly Val
965 970 975

Pro Phe Tyr Leu Asn Val Gln Tyr Arg Ile Asn Gly Leu Gly Val Thr
980 985 990

Met Asp Val Leu Ser Gln Asn Gln Lys Leu Ile Ala Ser Ala Phe Asn
995 1000 1005

Asn Ala Leu Asp Ala Ile Gln Glu Gly Phe Asp Ala Thr Asn Ser
1010 1015 1020

Ala Leu Val Lys Ile Gln Ala Val Val Asn Ala Asn Ala Glu Ala
1025 1030 1035

Leu Asn Asn Leu Leu Gln Gln Leu Ser Asn Arg Phe Gly Ala Ile
1040 1045 1050

Ser Ala Ser Leu Gln Glu Ile Leu Ser Arg Leu Asp Ala Leu Glu
1055 1060 1065

Ala Lys Ala Gln Ile Asp Arg Leu Ile Asn Gly Arg Leu Thr Ala
1070 1075 1080

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Leu Asn Ala Tyr Val Ser Gln Gln Leu Ser Asp Ser Thr Leu Val
1085 1090 1095

Lys Phe Ser Ala Ala Gln Ala Ile Glu Lys Val Asn Glu Cys Val
1100 1105 1110

Lys Ser Gln Ser Ser Arg Ile Asn Phe Cys Gly Asn Gly Asn His
1115 1120 1125

Ile Ile Ser Leu Val Gln Asn Ala Pro Tyr Gly Leu Tyr Phe Ile
1130 1135 1140

His Phe Ser Tyr Val Pro Thr Lys Tyr Val Thr Ala Lys Val Ser
1145 1150 1155

Pro Gly Leu Cys Ile Ala Gly Asp Ile Gly Ile Ser Pro Lys Ser
1160 1165 1170

Gly Tyr Phe Ile Asn Val Asn Asn Ser Trp Met Phe Thr Gly Ser
1175 1180 1185

Ser Tyr Tyr Tyr Pro Glu Pro Ile Thr Gln Asn Asn Val Val Val
1190 1195 1200

Met Ser Thr Cys Ala Val Asn Tyr Thr Lys Ala Pro Asp Leu Met
1205 1210 1215

Leu Asn Thr Ser Thr Pro Asn Leu Pro Asp Phe Lys Glu Glu Leu
1220 1225 1230

Tyr Gln Trp Phe Lys Asn Gln Ser Ser Val Ala Pro Asp Leu Ser
1235 1240 1245

Leu Asp Tyr Ile Asn Val Thr Phe Leu Asp Leu Gln Asp Glu Met
1250 1255 1260

Asn Arg Leu Gln Glu Ala Ile Lys Val Leu Asn Gln Ser Tyr Ile
1265 1270 1275

Asn Leu Lys Asp Ile Gly Thr Tyr Glu Tyr Tyr Val Lys Trp Pro
1280 1285 1290

Trp Tyr Val Trp Leu Leu Ile Gly Leu Ala Gly Val Ala Met Leu
1295 1300 1305

Val Leu Leu Phe Phe Ile Cys Cys Cys Thr Gly Cys Gly Thr Ser
1310 1315 1320

Cys Phe Lys Lys Cys Gly Gly Cys Cys Asp Asp Tyr Thr Gly His
1325 1330 1335

Gln Glu Phe Val Ile Lys Thr Ser His Asp Asp
1340 1345

<210> 61
<211> 1225
<212> PRT
<213> Porcine respiratory coronavirus

<400> 61

Met Lys Lys Leu Phe Val Val Leu Val Val Met Pro Leu Ile Tyr Gly
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Asp Lys Phe Pro Thr Ser Val Val Ser Asn Cys Thr Asp Gln Cys Ala
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Ser Tyr Val Ala Asn Val Phe Thr Thr Gln Pro Gly Gly Phe Ile Pro
35 40 45

Ser Asp Phe Ser Phe Asn Asn Trp Phe Leu Leu Thr Asn Ser Ser Thr
50 55 60

Leu Val Ser Gly Lys Leu Val Thr Lys Gln Pro Leu Leu Val Asn Cys
65 70 75 80

Leu Trp Pro Val Pro Ser Phe Glu Glu Ala Ala Ser Thr Phe Cys Phe
85 90 95

Glu Gly Ala Asp Phe Asp Gln Cys Asn Gly Ala Val Leu Asn Asn Thr
100 105 110

Val Asp Val Ile Arg Phe Asn Leu Asn Phe Thr Thr Asn Val Gln Ser
115 120 125

Gly Lys Gly Ala Thr Val Phe Ser Leu Asn Thr Thr Gly Gly Val Thr
130 135 140

Leu Glu Ile Ser Cys Tyr Asn Asp Thr Val Ser Asp Ser Ser Phe Ser
145 150 155 160

Ser Tyr Gly Glu Ile Pro Phe Gly Val Thr Asn Gly Pro Arg Tyr Cys
165 170 175

Tyr Val Leu Tyr Asn Gly Thr Ala Leu Lys Tyr Leu Gly Thr Leu Pro
180 185 190

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Pro Ser Val Lys Glu Ile Ala Ile Ser Lys Trp Gly His Phe Tyr Ile
195 200 205

Asn Gly Tyr Asn Phe Phe Ser Thr Phe Pro Ile Asp Cys Ile Ser Phe
210 215 220

Asn Leu Thr Thr Gly Asp Ser Asp Val Phe Trp Thr Ile Ala Tyr Thr
225 230 235 240

Ser Tyr Thr Glu Ala Leu Val Gln Val Glu Asn Thr Ala Ile Thr Asn
245 250 255

Val Thr Tyr Cys Asn Ser Tyr Val Asn Asn Ile Lys Cys Ser Gln Leu
260 265 270

Thr Ala Asn Leu Asn Asn Gly Phe Tyr Pro Val Ser Ser Ser Glu Val
275 280 285

Gly Ser Val Asn Lys Ser Val Val Leu Leu Pro Ser Phe Leu Thr His
290 295 300

Thr Ile Val Asn Ile Thr Ile Gly Leu Gly Met Lys Arg Ser Gly Tyr
305 310 315 320

Gly Gln Pro Ile Ala Ser Thr Leu Ser Asn Ile Thr Leu Pro Met Gln
325 330 335

Asp Asn Asn Thr Asp Val Tyr Cys Val Arg Ser Asp Gln Phe Ser Val
340 345 350

Tyr Val His Ser Thr Cys Lys Ser Ala Leu Trp Asp Asn Val Phe Lys
355 360 365

Arg Asn Cys Thr Asp Val Leu Asp Ala Thr Ala Val Ile Lys Thr Gly
370 375 380

Thr Cys Pro Phe Ser Phe Asp Lys Leu Asn Asn Tyr Leu Thr Phe Asn
385 390 395 400

Lys Phe Cys Leu Ser Leu Ser Pro Val Gly Ala Asn Cys Lys Phe Asp
405 410 415

Val Ala Ala Arg Thr Arg Thr Asn Glu Gln Val Val Arg Ser Leu Tyr
420 425 430

Val Ile Tyr Glu Glu Gly Asp Ser Ile Val Gly Val Pro Ser Asp Asn
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435

440

445

Ser Gly Leu His Asp Leu Ser Val Leu His Leu Asp Ser Cys Thr Asp
 450 455 460

Tyr Asn Ile Tyr Gly Arg Thr Gly Val Gly Ile Ile Arg Gln Thr Asn
 465 470 475 480

Arg Thr Leu Leu Ser Gly Leu Tyr Tyr Thr Ser Leu Ser Gly Asp Leu
 485 490 495

Leu Gly Phe Lys Asn Val Ser Asp Gly Val Ile Tyr Ser Val Thr Pro
 500 505 510

Cys Asp Val Ser Ala Gln Ala Ala Val Ile Asp Gly Thr Ile Val Gly
 515 520 525

Ala Ile Thr Ser Ile Asn Ser Glu Leu Leu Gly Leu Thr His Trp Thr
 530 535 540

Ile Thr Pro Asn Phe Tyr Tyr Tyr Ser Ile Tyr Asn Tyr Thr Asn Asp
 545 550 555 560

Lys Thr Arg Gly Thr Pro Ile Asp Ser Asn Asp Val Gly Cys Glu Pro
 565 570 575

Val Ile Thr Tyr Ser Asn Ile Gly Val Cys Lys Asn Gly Ala Leu Val
 580 585 590

Phe Ile Asn Val Thr His Ser Asp Gly Asp Val Gln Pro Ile Ser Thr
 595 600 605

Gly Asn Val Thr Ile Pro Thr Asn Phe Thr Ile Ser Val Gln Val Glu
 610 615 620

Tyr Ile Gln Val Tyr Thr Thr Pro Val Ser Ile Asp Cys Ser Arg Tyr
 625 630 635 640

Val Cys Asn Gly Asn Pro Arg Cys Asn Lys Leu Leu Thr Gln Tyr Val
 645 650 655

Ser Ala Cys Gln Thr Ile Glu Gln Ala Leu Ala Met Gly Ala Arg Leu
 660 665 670

Glu Asn Met Glu Val Asp Ser Met Leu Phe Val Ser Glu Asn Ala Leu
 675 680 685

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Lys Leu Ala Ser Val Glu Ala Phe Asn Ser Ser Glu Thr Leu Asp Pro
690 695 700

Ile Tyr Thr Gln Trp Pro Asn Ile Gly Gly Phe Trp Leu Glu Gly Leu
705 710 715 720

Lys Tyr Ile Leu Pro Ser Asp Asn Ser Lys Arg Lys Tyr Arg Ser Ala
725 730 735

Ile Glu Asp Leu Leu Phe Ser Lys Val Val Thr Ser Gly Leu Gly Thr
740 745 750

Val Asp Glu Asp Tyr Lys Arg Cys Thr Gly Gly Tyr Asp Ile Ala Asp
755 760 765

Leu Val Cys Ala Gln Tyr Tyr Asn Gly Ile Met Val Leu Pro Gly Val
770 775 780

Ala Asn Ala Asp Lys Met Thr Met Tyr Thr Ala Ser Leu Ala Gly Gly
785 790 795 800

Ile Thr Leu Gly Ala Phe Gly Gly Gly Ala Val Ser Ile Pro Phe Ala
805 810 815

Val Ala Val Gln Ala Arg Leu Asn Tyr Val Ala Leu Gln Thr Asp Val
820 825 830

Leu Asn Lys Asn Gln Gln Ile Leu Ala Ser Ala Phe Asn Gln Ala Ile
835 840 845

Gly Asn Ile Thr Gln Ser Phe Gly Lys Val Asn Asp Ala Ile His Gln
850 855 860

Thr Ser Arg Gly Leu Thr Thr Val Ala Lys Ala Leu Ala Lys Val Gln
865 870 875 880

Asp Val Val Asn Thr Gln Gly Gln Ala Leu Arg His Leu Thr Val Gln
885 890 895

Leu Gln Asn Asn Phe Gln Ala Ile Ser Ser Ser Ile Ser Asp Ile Tyr
900 905 910

Asn Arg Leu Asp Glu Leu Ser Ala Asp Ala Gln Val Asp Arg Leu Ile
915 920 925

Thr Gly Arg Leu Thr Ala Leu Asn Ala Phe Val Ser Gln Thr Leu Thr
930 935 940

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Arg Gln Ala Glu Val Arg Ala Ser Arg Gln Leu Ala Lys Asp Lys Val
945 950 955 960

Asn Glu Cys Val Arg Ser Gln Ser Gln Arg Phe Gly Phe Cys Gly Asn
965 970 975

Gly Thr His Leu Phe Ser Leu Ala Asn Ala Ala Pro Asn Gly Met Ile
980 985 990

Phe Phe His Thr Val Leu Leu Pro Thr Ala Tyr Glu Thr Val Thr Ala
995 1000 1005

Trp Ser Gly Ile Cys Ala Leu Asp Gly Asp Arg Thr Phe Gly Leu
1010 1015 1020

Val Val Lys Asp Val Gln Leu Thr Leu Phe Arg Asn Leu Asp Asp
1025 1030 1035

Lys Phe Tyr Leu Thr Pro Arg Thr Met Tyr Gln Pro Arg Val Ala
1040 1045 1050

Thr Ser Ser Asp Phe Val Gln Ile Glu Gly Cys Asp Val Leu Phe
1055 1060 1065

Val Asn Thr Thr Val Ser Asp Leu Pro Ser Ile Ile Pro Asp Tyr
1070 1075 1080

Ile Asp Ile Asn Gln Thr Val Gln Asp Ile Leu Glu Asn Phe Arg
1085 1090 1095

Pro Asn Trp Thr Val Pro Glu Leu Thr Leu Asp Val Phe Asn Ala
1100 1105 1110

Thr Tyr Leu Asn Leu Thr Gly Glu Ile Asp Asp Leu Glu Phe Arg
1115 1120 1125

Ser Glu Lys Leu His Asn Thr Thr Val Glu Leu Ala Ile Leu Ile
1130 1135 1140

Asp Asn Ile Asn Asn Thr Leu Val Asn Leu Glu Trp Leu Asn Arg
1145 1150 1155

Ile Glu Thr Tyr Val Lys Trp Pro Trp Tyr Val Trp Leu Leu Ile
1160 1165 1170

Gly Leu Val Val Ile Phe Cys Ile Pro Leu Leu Leu Phe Cys Cys
1175 1180 1185

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Cys Ser Thr Gly Cys Cys Gly Cys Ile Gly Cys Leu Gly Ser Cys
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Cys His Ser Ile Phe Ser Arg Arg Gln Phe Glu Asn Tyr Glu Pro
1205 1210 1215

Ile Glu Lys Val His Val His
1220 1225

<210> 62
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<212> PRT
<213> Porcine transmissible gastroenteritis coronavirus
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Ser Ile Ala Leu Leu Asn Ile Ile Lys Leu Cys Met Val Cys Cys Asn
35 40 45

Leu Gly Arg Thr Val Ile Ile Val Pro Ala Gln His Ala Tyr Asp Ala
50 55 60

Tyr Lys Asn Phe Met Arg Ile Lys Ala Tyr Asn Pro Asp Gly Ala Leu
65 70 75 80

Leu Ala

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<400> 63

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Ser Leu Pro Val Leu Gln Val Arg Asp Val Leu Val Arg Gly Phe Gly
20 25 30

Asp Ser Val Glu Glu Ala Leu Ser Glu Ala Arg Glu His Leu Lys Asn
35 40 45

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Gly Thr Cys Gly Leu Val Glu Leu Glu Lys Gly Val Leu Pro Gln Leu
50 55 60

Glu Gln Pro Tyr Val Phe Ile Lys Arg Ser Asp Ala Leu Ser Thr Asn
65 70 75 80

His Gly His Lys Val Val Glu Leu Val Ala Glu Met Asp Gly Ile Gln
85 90 95

Tyr Gly Arg Ser Gly Ile Thr Leu Gly Val Leu Val Pro His Val Gly
100 105 110

Glu Thr Pro Ile Ala Tyr Arg Asn Val Leu Leu Arg Lys Asn Gly Asn
115 120 125

Lys Gly Ala Gly Gly His Ser Tyr Gly Ile Asp Leu Lys Ser Tyr Asp
130 135 140

Leu Gly Asp Glu Leu Gly Thr Asp Pro Ile Glu Asp Tyr Glu Gln Asn
145 150 155 160

Trp Asn Thr Lys His Gly Ser Gly Ala Leu Arg Glu Leu Thr Arg Glu
165 170 175

Leu Asn Gly Gly Ala Val Thr Arg Tyr Val Asp Asn Asn Phe Cys Gly
180 185 190

Pro Asp Gly Tyr Pro Leu Asp Cys Ile Lys Asp Phe Leu Ala Arg Ala
195 200 205

Gly Lys Ser Met Cys Thr Leu Ser Glu Gln Leu Asp Tyr Ile Glu Ser
210 215 220

Lys Arg Gly Val Tyr Cys Cys Arg Asp His Glu His Glu Ile Ala Trp
225 230 235 240

Phe Thr Glu Arg Ser Asp Lys Ser Tyr Glu His Gln Thr Pro Phe Glu
245 250 255

Ile Lys Ser Ala Lys Lys Phe Asp Thr Phe Lys Gly Glu Cys Pro Lys
260 265 270

Phe Val Phe Pro Leu Asn Ser Lys Val Lys Val Ile Gln Pro Arg Val
275 280 285

Glu Lys Lys Lys Thr Glu Gly Phe Met Gly Arg Ile Arg Ser Val Tyr
290 295 300

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Pro Val Ala Ser Pro Gln Glu Cys Asn Asn Met His Leu Ser Thr Leu
305 310 315 320

Met Lys Cys Asn His Cys Asp Glu Val Ser Trp Gln Thr Cys Asp Phe
325 330 335

Leu Lys Ala Thr Cys Glu His Cys Gly Thr Glu Asn Leu Val Ile Glu
340 345 350

Gly Pro Thr Thr Cys Gly Tyr Leu Pro Thr Asn Ala Val Val Lys Met
355 360 365

Pro Cys Pro Ala Cys Gln Asp Pro Glu Ile Gly Pro Glu His Ser Val
370 375 380

Ala Asp Tyr His Asn His Ser Asn Ile Glu Thr Arg Leu Arg Lys Gly
385 390 395 400

Gly Arg Thr Arg Cys Phe Gly Gly Cys Val Phe Ala Tyr Val Gly Cys
405 410 415

Tyr Asn Lys Arg Ala Tyr Trp Val Pro Arg Ala Ser Ala Asp Ile Gly
420 425 430

Ser Gly His Thr Gly Ile Thr Gly Asp Asn Val Glu Thr Leu Asn Glu
435 440 445

Asp Leu Leu Glu Ile Leu Ser Arg Glu Arg Val Asn Ile Asn Ile Val
450 455 460

Gly Asp Phe His Leu Asn Glu Glu Val Ala Ile Ile Leu Ala Ser Phe
465 470 475 480

Ser Ala Ser Thr Ser Ala Phe Ile Asp Thr Ile Lys Ser Leu Asp Tyr
485 490 495

Lys Ser Phe Lys Thr Ile Val Glu Ser Cys Gly Asn Tyr Lys Val Thr
500 505 510

Lys Gly Lys Pro Val Lys Gly Ala Trp Asn Ile Gly Gln Gln Arg Ser
515 520 525

Val Leu Thr Pro Leu Cys Gly Phe Pro Ser Gln Ala Ala Gly Val Ile
530 535 540

Arg Ser Ile Phe Ala Arg Thr Leu Asp Ala Ala Asn His Ser Ile Pro
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545					550					555					560
Asp	Leu	Gln	Arg	Ala 565	Ala	Val	Thr	Ile	Leu 570	Asp	Gly	Ile	Ser	Glu 575	Gln
Ser	Leu	Arg	Leu 580	Val	Asp	Ala	Met	Val 585	Tyr	Thr	Ser	Asp	Leu 590	Leu	Thr
Asn	Ser	Val 595	Ile	Ile	Met	Ala	Tyr 600	Val	Thr	Gly	Gly	Leu 605	Val	Gln	Gln
Thr	Ser 610	Gln	Trp	Leu	Ser	Asn 615	Leu	Leu	Gly	Thr	Thr 620	Val	Glu	Lys	Leu
Arg 625	Pro	Ile	Phe	Glu	Trp 630	Ile	Glu	Ala	Lys	Leu 635	Ser	Ala	Gly	Val	Glu 640
Phe	Leu	Lys	Asp	Ala 645	Trp	Glu	Ile	Leu	Lys 650	Phe	Leu	Ile	Thr	Gly 655	Val
Phe	Asp	Ile	Val 660	Lys	Gly	Gln	Ile	Gln 665	Val	Ala	Ser	Asp	Asn 670	Ile	Lys
Asp	Cys	Val 675	Lys	Cys	Phe	Ile	Asp 680	Val	Val	Asn	Lys	Ala 685	Leu	Glu	Met
Cys 690	Ile	Asp	Gln	Val	Thr	Ile 695	Ala	Gly	Ala	Lys	Leu 700	Arg	Ser	Leu	Asn
Leu 705	Gly	Glu	Val	Phe	Ile 710	Ala	Gln	Ser	Lys	Gly 715	Leu	Tyr	Arg	Gln	Cys 720
Ile	Arg	Gly	Lys	Glu 725	Gln	Leu	Gln	Leu	Leu 730	Met	Pro	Leu	Lys	Ala 735	Pro
Lys	Glu	Val 740	Thr	Phe	Leu	Glu	Gly	Asp 745	Ser	His	Asp	Thr	Val 750	Leu	Thr
Ser	Glu	Glu 755	Val	Val	Leu	Lys	Asn 760	Gly	Glu	Leu	Glu	Ala 765	Leu	Glu	Thr
Pro 770	Val	Asp	Ser	Phe	Thr	Asn 775	Gly	Ala	Ile	Val	Gly 780	Thr	Pro	Val	Cys
Val 785	Asn	Gly	Leu	Met	Leu 790	Leu	Glu	Ile	Lys	Asp 795	Lys	Glu	Gln	Tyr	Cys 800

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Ala Leu Ser Pro Gly Leu Leu Ala Thr Asn Asn Val Phe Arg Leu Lys
805 810 815

Gly Gly Ala Pro Ile Lys Gly Val Thr Phe Gly Glu Asp Thr Val Trp
820 825 830

Glu Val Gln Gly Tyr Lys Asn Val Arg Ile Thr Phe Glu Leu Asp Glu
835 840 845

Arg Val Asp Lys Val Leu Asn Glu Lys Cys Ser Val Tyr Thr Val Glu
850 855 860

Ser Gly Thr Glu Val Thr Glu Phe Ala Cys Val Val Ala Glu Ala Val
865 870 875 880

Val Lys Thr Leu Gln Pro Val Ser Asp Leu Leu Thr Asn Met Gly Ile
885 890 895

Asp Leu Asp Glu Trp Ser Val Ala Thr Phe Tyr Leu Phe Asp Asp Ala
900 905 910

Gly Glu Glu Asn Phe Ser Ser Arg Met Tyr Cys Ser Phe Tyr Pro Pro
915 920 925

Asp Glu Glu Glu Glu Asp Asp Ala Glu Cys Glu Glu Glu Glu Ile Asp
930 935 940

Glu Thr Cys Glu His Glu Tyr Gly Thr Glu Asp Asp Tyr Gln Gly Leu
945 950 955 960

Pro Leu Glu Phe Gly Ala Ser Ala Glu Thr Val Arg Val Glu Glu Glu
965 970 975

Glu Glu Glu Asp Trp Leu Asp Asp Thr Thr Glu Gln Ser Glu Ile Glu
980 985 990

Pro Glu Pro Glu Pro Thr Pro Glu Glu Pro Val Asn Gln Phe Thr Gly
995 1000 1005

Tyr Leu Lys Leu Thr Asp Asn Val Ala Ile Lys Cys Val Asp Ile
1010 1015 1020

Val Lys Glu Ala Gln Ser Ala Asn Pro Met Val Ile Val Asn Ala
1025 1030 1035

Ala Asn Ile His Leu Lys His Gly Gly Gly Val Ala Gly Ala Leu
1040 1045 1050

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Asn Lys Ala Thr Asn Gly Ala Met Gln Lys Glu Ser Asp Asp Tyr
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Ile Lys Leu Asn Gly Pro Leu Thr Val Gly Gly Ser Cys Leu Leu
1070 1075 1080

Ser Gly His Asn Leu Ala Lys Lys Cys Leu His Val Val Gly Pro
1085 1090 1095

Asn Leu Asn Ala Gly Glu Asp Ile Gln Leu Leu Lys Ala Ala Tyr
1100 1105 1110

Glu Asn Phe Asn Ser Gln Asp Ile Leu Leu Ala Pro Leu Leu Ser
1115 1120 1125

Ala Gly Ile Phe Gly Ala Lys Pro Leu Gln Ser Leu Gln Val Cys
1130 1135 1140

Val Gln Thr Val Arg Thr Gln Val Tyr Ile Ala Val Asn Asp Lys
1145 1150 1155

Ala Leu Tyr Glu Gln Val Val Met Asp Tyr Leu Asp Asn Leu Lys
1160 1165 1170

Pro Arg Val Glu Ala Pro Lys Gln Glu Glu Pro Pro Asn Thr Glu
1175 1180 1185

Asp Ser Lys Thr Glu Glu Lys Ser Val Val Gln Lys Pro Val Asp
1190 1195 1200

Val Lys Pro Lys Ile Lys Ala Cys Ile Asp Glu Val Thr Thr Thr
1205 1210 1215

Leu Glu Glu Thr Lys Phe Leu Thr Asn Lys Leu Leu Leu Phe Ala
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Asp Ile Asn Gly Lys Leu Tyr His Asp Ser Gln Asn Met Leu Arg
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Gly Glu Asp Met Ser Phe Leu Glu Lys Asp Ala Pro Tyr Met Val
1250 1255 1260

Gly Asp Val Ile Thr Ser Gly Asp Ile Thr Cys Val Val Ile Pro
1265 1270 1275

Ser Lys Lys Ala Gly Gly Thr Thr Glu Met Leu Ser Arg Ala Leu
1280 1285 1290

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Lys	Cys	Lys	Ser	Ala	Phe	Tyr	Val	Leu	Pro	Ser	Glu	Ala	Pro	Asn
	1325					1330					1335			
Ala	Lys	Glu	Glu	Ile	Leu	Gly	Thr	Val	Ser	Trp	Asn	Leu	Arg	Glu
	1340					1345					1350			
Met	Leu	Ala	His	Ala	Glu	Glu	Thr	Arg	Lys	Leu	Met	Pro	Ile	Cys
	1355					1360					1365			
Met	Asp	Val	Arg	Ala	Ile	Met	Ala	Thr	Ile	Gln	Arg	Lys	Tyr	Lys
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Gly	Ile	Lys	Ile	Gln	Glu	Gly	Ile	Val	Asp	Tyr	Gly	Val	Arg	Phe
	1385					1390					1395			
Phe	Phe	Tyr	Thr	Ser	Lys	Glu	Pro	Val	Ala	Ser	Ile	Ile	Thr	Lys
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Leu	Asn	Ser	Leu	Asn	Glu	Pro	Leu	Val	Thr	Met	Pro	Ile	Gly	Tyr
	1415					1420					1425			
Val	Thr	His	Gly	Phe	Asn	Leu	Glu	Glu	Ala	Ala	Arg	Cys	Met	Arg
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Ser	Leu	Lys	Ala	Pro	Ala	Val	Val	Ser	Val	Ser	Ser	Pro	Asp	Ala
	1445					1450					1455			
Val	Thr	Thr	Tyr	Asn	Gly	Tyr	Leu	Thr	Ser	Ser	Ser	Lys	Thr	Ser
	1460					1465					1470			
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1520

Lys	Ser	Leu	Leu	Ser	Leu	Arg	Glu	Val	Lys	Thr	Ile	Lys	Val	Phe
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Ala	Asp	Val	Thr	Lys	Ile	Lys	Pro	His	Val	Asn	His	Glu	Gly	Lys
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Met	Ser	Ala	Leu	Asn	His	Thr	Lys	Lys	Trp	Lys	Phe	Pro	Gln	Val
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1640						1645					1650			
Ser	Ser	Val	Leu	Leu	Ala	Leu	Gln	Gln	Leu	Glu	Val	Lys	Phe	Asn
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Val	Gly	Glu	Leu	Gly	Asp	Val	Arg	Glu	Thr	Met	Thr	His	Leu	Leu
1700						1705					1710			
Gln	His	Ala	Asn	Leu	Glu	Ser	Ala	Lys	Arg	Val	Leu	Asn	Val	Val
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Cys	Lys	His	Cys	Gly	Gln	Lys	Thr	Thr	Thr	Leu	Thr	Gly	Val	Glu
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Ala	Val	Met	Tyr	Met	Gly	Thr	Leu	Ser	Tyr	Asp	Asn	Leu	Lys	Thr
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Gly Val Ser Ile Pro Cys Val Cys Gly Arg Asp Ala Thr Gln Tyr
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 Leu Val Gln Gln Glu Ser Ser Phe Val Met Met Ser Ala Pro Pro
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 Ala Glu Tyr Lys Leu Gln Gln Gly Thr Phe Leu Cys Ala Asn Glu
 1790 1795 1800
 Tyr Thr Gly Asn Tyr Gln Cys Gly His Tyr Thr His Ile Thr Ala
 1805 1810 1815
 Lys Glu Thr Leu Tyr Arg Ile Asp Gly Ala His Leu Thr Lys Met
 1820 1825 1830
 Ser Glu Tyr Lys Gly Pro Val Thr Asp Val Phe Tyr Lys Glu Thr
 1835 1840 1845
 Ser Tyr Thr Thr Thr Ile Lys Pro Val Ser Tyr Lys Leu Asp Gly
 1850 1855 1860
 Val Thr Tyr Thr Glu Ile Glu Pro Lys Leu Asp Gly Tyr Tyr Lys
 1865 1870 1875
 Lys Asp Asn Ala Tyr Tyr Thr Glu Gln Pro Ile Asp Leu Val Pro
 1880 1885 1890
 Thr Gln Pro Leu Pro Asn Ala Ser Phe Asp Asn Phe Lys Leu Thr
 1895 1900 1905
 Cys Ser Asn Thr Lys Phe Ala Asp Asp Leu Asn Gln Met Thr Gly
 1910 1915 1920
 Phe Thr Lys Pro Ala Ser Arg Glu Leu Ser Val Thr Phe Phe Pro
 1925 1930 1935
 Asp Leu Asn Gly Asp Val Val Ala Ile Asp Tyr Arg His Tyr Ser
 1940 1945 1950
 Ala Ser Phe Lys Lys Gly Ala Lys Leu Leu His Lys Pro Ile Val
 1955 1960 1965
 Trp His Ile Asn Gln Ala Thr Thr Lys Thr Thr Phe Lys Pro Asn
 1970 1975 1980
 Thr Trp Cys Leu Arg Cys Leu Trp Ser Thr Lys Pro Val Asp Thr
 1985 1990 1995

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Ser Asn Ser Phe Glu Val Leu Ala Val Glu Asp Thr Gln Gly Met
2000 2005 2010

Asp Asn Leu Ala Cys Glu Ser Gln Gln Pro Thr Ser Glu Glu Val
2015 2020 2025

Val Glu Asn Pro Thr Ile Gln Lys Glu Val Ile Glu Cys Asp Val
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Lys Thr Thr Glu Val Val Gly Asn Val Ile Leu Lys Pro Ser Asp
2045 2050 2055

Glu Gly Val Lys Val Thr Gln Glu Leu Gly His Glu Asp Leu Met
2060 2065 2070

Ala Ala Tyr Val Glu Asn Thr Ser Ile Thr Ile Lys Lys Pro Asn
2075 2080 2085

Glu Leu Ser Leu Ala Leu Gly Leu Lys Thr Ile Ala Thr His Gly
2090 2095 2100

Ile Ala Ala Ile Asn Ser Val Pro Trp Ser Lys Ile Leu Ala Tyr
2105 2110 2115

Val Lys Pro Phe Leu Gly Gln Ala Ala Ile Thr Thr Ser Asn Cys
2120 2125 2130

Ala Lys Arg Leu Ala Gln Arg Val Phe Asn Asn Tyr Met Pro Tyr
2135 2140 2145

Val Phe Thr Leu Leu Phe Gln Leu Cys Thr Phe Thr Lys Ser Thr
2150 2155 2160

Asn Ser Arg Ile Arg Ala Ser Leu Pro Thr Thr Ile Ala Lys Asn
2165 2170 2175

Ser Val Lys Ser Val Ala Lys Leu Cys Leu Asp Ala Gly Ile Asn
2180 2185 2190

Tyr Val Lys Ser Pro Lys Phe Ser Lys Leu Phe Thr Ile Ala Met
2195 2200 2205

Trp Leu Leu Leu Leu Ser Ile Cys Leu Gly Ser Leu Ile Cys Val
2210 2215 2220

Thr Ala Ala Phe Gly Val Leu Leu Ser Asn Phe Gly Ala Pro Ser
2225 2230 2235

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Tyr	Cys	Asn	Gly	Val	Arg	Glu	Leu	Tyr	Leu	Asn	Ser	Ser	Asn	Val
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Thr	Thr	Met	Asp	Phe	Cys	Glu	Gly	Ser	Phe	Pro	Cys	Ser	Ile	Cys
	2255					2260					2265			
Leu	Ser	Gly	Leu	Asp	Ser	Leu	Asp	Ser	Tyr	Pro	Ala	Leu	Glu	Thr
	2270					2275					2280			
Ile	Gln	Val	Thr	Ile	Ser	Ser	Tyr	Lys	Leu	Asp	Leu	Thr	Ile	Leu
	2285					2290					2295			
Gly	Leu	Ala	Ala	Glu	Trp	Val	Leu	Ala	Tyr	Met	Leu	Phe	Thr	Lys
	2300					2305					2310			
Phe	Phe	Tyr	Leu	Leu	Gly	Leu	Ser	Ala	Ile	Met	Gln	Val	Phe	Phe
	2315					2320					2325			
Gly	Tyr	Phe	Ala	Ser	His	Phe	Ile	Ser	Asn	Ser	Trp	Leu	Met	Trp
	2330					2335					2340			
Phe	Ile	Ile	Ser	Ile	Val	Gln	Met	Ala	Pro	Val	Ser	Ala	Met	Val
	2345					2350					2355			
Arg	Met	Tyr	Ile	Phe	Phe	Ala	Ser	Phe	Tyr	Tyr	Ile	Trp	Lys	Ser
	2360					2365					2370			
Tyr	Val	His	Ile	Met	Asp	Gly	Cys	Thr	Ser	Ser	Thr	Cys	Met	Met
	2375					2380					2385			
Cys	Tyr	Lys	Arg	Asn	Arg	Ala	Thr	Arg	Val	Glu	Cys	Thr	Thr	Ile
	2390					2395					2400			
Val	Asn	Gly	Met	Lys	Arg	Ser	Phe	Tyr	Val	Tyr	Ala	Asn	Gly	Gly
	2405					2410					2415			
Arg	Gly	Phe	Cys	Lys	Thr	His	Asn	Trp	Asn	Cys	Leu	Asn	Cys	Asp
	2420					2425					2430			
Thr	Phe	Cys	Thr	Gly	Ser	Thr	Phe	Ile	Ser	Asp	Glu	Val	Ala	Arg
	2435					2440					2445			
Asp	Leu	Ser	Leu	Gln	Phe	Lys	Arg	Pro	Ile	Asn	Pro	Thr	Asp	Gln
	2450					2455					2460			
Ser	Ser	Tyr	Ile	Val	Asp	Ser	Val	Ala	Val	Lys	Asn	Gly	Ala	Leu

2465

His	Leu	Tyr	Phe	Asp	Lys	Ala	Gly	Gln	Lys	Thr	Tyr	Glu	Arg	His
	2480					2485					2490			
Pro	Leu	Ser	His	Phe	Val	Asn	Leu	Asp	Asn	Leu	Arg	Ala	Asn	Asn
	2495					2500					2505			
Thr	Lys	Gly	Ser	Leu	Pro	Ile	Asn	Val	Ile	Val	Phe	Asp	Gly	Lys
	2510					2515					2520			
Ser	Lys	Cys	Asp	Glu	Ser	Ala	Ser	Lys	Ser	Ala	Ser	Val	Tyr	Tyr
	2525					2530					2535			
Ser	Gln	Leu	Met	Cys	Gln	Pro	Ile	Leu	Leu	Leu	Asp	Gln	Ala	Leu
	2540					2545					2550			
Val	Ser	Asp	Val	Gly	Asp	Ser	Thr	Glu	Val	Ser	Val	Lys	Met	Phe
	2555					2560					2565			
Asp	Ala	Tyr	Val	Asp	Thr	Phe	Ser	Ala	Thr	Phe	Ser	Val	Pro	Met
	2570					2575					2580			
Glu	Lys	Leu	Lys	Ala	Leu	Val	Ala	Thr	Ala	His	Ser	Glu	Leu	Ala
	2585					2590					2595			
Lys	Gly	Val	Ala	Leu	Asp	Gly	Val	Leu	Ser	Thr	Phe	Val	Ser	Ala
	2600					2605					2610			
Ala	Arg	Gln	Gly	Val	Val	Asp	Thr	Asp	Val	Asp	Thr	Lys	Asp	Val
	2615					2620					2625			
Ile	Glu	Cys	Leu	Lys	Leu	Ser	His	His	Ser	Asp	Leu	Glu	Val	Thr
	2630					2635					2640			
Gly	Asp	Ser	Cys	Asn	Asn	Phe	Met	Leu	Thr	Tyr	Asn	Lys	Val	Glu
	2645					2650					2655			
Asn	Met	Thr	Pro	Arg	Asp	Leu	Gly	Ala	Cys	Ile	Asp	Cys	Asn	Ala
	2660					2665					2670			
Arg	His	Ile	Asn	Ala	Gln	Val	Ala	Lys	Ser	His	Asn	Val	Ser	Leu
	2675					2680					2685			
Ile	Trp	Asn	Val	Lys	Asp	Tyr	Met	Ser	Leu	Ser	Glu	Gln	Leu	Arg
	2690					2695					2700			

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Lys Gln Ile Arg Ser Ala Ala Lys Lys Asn Asn Ile Pro Phe Arg
 2705 2710 2715
 Leu Thr Cys Ala Thr Thr Arg Gln Val Val Asn Val Ile Thr Thr
 2720 2725 2730
 Lys Ile Ser Leu Lys Gly Gly Lys Ile Val Ser Thr Cys Phe Lys
 2735 2740 2745
 Leu Met Leu Lys Ala Thr Leu Leu Cys Val Leu Ala Ala Leu Val
 2750 2755 2760
 Cys Tyr Ile Val Met Pro Val His Thr Leu Ser Ile His Asp Gly
 2765 2770 2775
 Tyr Thr Asn Glu Ile Ile Gly Tyr Lys Ala Ile Gln Asp Gly Val
 2780 2785 2790
 Thr Arg Asp Ile Ile Ser Thr Asp Asp Cys Phe Ala Asn Lys His
 2795 2800 2805
 Ala Gly Phe Asp Ala Trp Phe Ser Gln Arg Gly Gly Ser Tyr Lys
 2810 2815 2820
 Asn Asp Lys Ser Cys Pro Val Val Ala Ala Ile Ile Thr Arg Glu
 2825 2830 2835
 Ile Gly Phe Ile Val Pro Gly Leu Pro Gly Thr Val Leu Arg Ala
 2840 2845 2850
 Ile Asn Gly Asp Phe Leu His Phe Leu Pro Arg Val Phe Ser Ala
 2855 2860 2865
 Val Gly Asn Ile Cys Tyr Thr Pro Ser Lys Leu Ile Glu Tyr Ser
 2870 2875 2880
 Asp Phe Ala Thr Ser Ala Cys Val Leu Ala Ala Glu Cys Thr Ile
 2885 2890 2895
 Phe Lys Asp Ala Met Gly Lys Pro Val Pro Tyr Cys Tyr Asp Thr
 2900 2905 2910
 Asn Leu Leu Glu Gly Ser Ile Ser Tyr Ser Glu Leu Arg Pro Asp
 2915 2920 2925
 Thr Arg Tyr Val Leu Met Asp Gly Ser Ile Ile Gln Phe Pro Asn
 2930 2935 2940

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Thr	Tyr	Leu	Glu	Gly	Ser	Val	Arg	Val	Val	Thr	Thr	Phe	Asp	Ala
	2945					2950					2955			
Glu	Tyr	Cys	Arg	His	Gly	Thr	Cys	Glu	Arg	Ser	Glu	Val	Gly	Ile
	2960					2965					2970			
Cys	Leu	Ser	Thr	Ser	Gly	Arg	Trp	Val	Leu	Asn	Asn	Glu	His	Tyr
	2975					2980					2985			
Arg	Ala	Leu	Ser	Gly	Val	Phe	Cys	Gly	Val	Asp	Ala	Met	Asn	Leu
	2990					2995					3000			
Ile	Ala	Asn	Ile	Phe	Thr	Pro	Leu	Val	Gln	Pro	Val	Gly	Ala	Leu
	3005					3010					3015			
Asp	Val	Ser	Ala	Ser	Val	Val	Ala	Gly	Gly	Ile	Ile	Ala	Ile	Leu
	3020					3025					3030			
Val	Thr	Cys	Ala	Ala	Tyr	Tyr	Phe	Met	Lys	Phe	Arg	Arg	Val	Phe
	3035					3040					3045			
Gly	Glu	Tyr	Asn	His	Val	Val	Ala	Ala	Asn	Ala	Leu	Leu	Phe	Leu
	3050					3055					3060			
Met	Ser	Phe	Thr	Ile	Leu	Cys	Leu	Val	Pro	Ala	Tyr	Ser	Phe	Leu
	3065					3070					3075			
Pro	Gly	Val	Tyr	Ser	Val	Phe	Tyr	Leu	Tyr	Leu	Thr	Phe	Tyr	Phe
	3080					3085					3090			
Thr	Asn	Asp	Val	Ser	Phe	Leu	Ala	His	Leu	Gln	Trp	Phe	Ala	Met
	3095					3100					3105			
Phe	Ser	Pro	Ile	Val	Pro	Phe	Trp	Ile	Thr	Ala	Ile	Tyr	Val	Phe
	3110					3115					3120			
Cys	Ile	Ser	Leu	Lys	His	Cys	His	Trp	Phe	Phe	Asn	Asn	Tyr	Leu
	3125					3130					3135			
Arg	Lys	Arg	Val	Met	Phe	Asn	Gly	Val	Thr	Phe	Ser	Thr	Phe	Glu
	3140					3145					3150			
Glu	Ala	Ala	Leu	Cys	Thr	Phe	Leu	Leu	Asn	Lys	Glu	Met	Tyr	Leu
	3155					3160					3165			
Lys	Leu	Arg	Ser	Glu	Thr	Leu	Leu	Pro	Leu	Thr	Gln	Tyr	Asn	Arg
	3170					3175					3180			

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Tyr Leu Ala Leu Tyr Asn Lys Tyr Lys Tyr Phe Ser Gly Ala Leu
 3185 3190 3195
 Asp Thr Thr Ser Tyr Arg Glu Ala Ala Cys Cys His Leu Ala Lys
 3200 3205 3210
 Ala Leu Asn Asp Phe Ser Asn Ser Gly Ala Asp Val Leu Tyr Gln
 3215 3220 3225
 Pro Pro Gln Thr Ser Ile Thr Ser Ala Val Leu Gln Ser Gly Phe
 3230 3235 3240
 Arg Lys Met Ala Phe Pro Ser Gly Lys Val Glu Gly Cys Met Val
 3245 3250 3255
 Gln Val Thr Cys Gly Thr Thr Thr Leu Asn Gly Leu Trp Leu Asp
 3260 3265 3270
 Asp Thr Val Tyr Cys Pro Arg His Val Ile Cys Thr Ala Glu Asp
 3275 3280 3285
 Met Leu Asn Pro Asn Tyr Glu Asp Leu Leu Ile Arg Lys Ser Asn
 3290 3295 3300
 His Ser Phe Leu Val Gln Ala Gly Asn Val Gln Leu Arg Val Ile
 3305 3310 3315
 Gly His Ser Met Gln Asn Cys Leu Leu Arg Leu Lys Val Asp Thr
 3320 3325 3330
 Ser Asn Pro Lys Thr Pro Lys Tyr Lys Phe Val Arg Ile Gln Pro
 3335 3340 3345
 Gly Gln Thr Phe Ser Val Leu Ala Cys Tyr Asn Gly Ser Pro Ser
 3350 3355 3360
 Gly Val Tyr Gln Cys Ala Met Arg Pro Asn His Thr Ile Lys Gly
 3365 3370 3375
 Ser Phe Leu Asn Gly Ser Cys Gly Ser Val Gly Phe Asn Ile Asp
 3380 3385 3390
 Tyr Asp Cys Val Ser Phe Cys Tyr Met His His Met Glu Leu Pro
 3395 3400 3405
 Thr Gly Val His Ala Gly Thr Asp Leu Glu Gly Lys Phe Tyr Gly

3410

Pro Phe Val Asp Arg Gln Thr Ala Gln Ala Ala Gly Thr Asp Thr
3425 3430 3435

Thr Ile Thr Leu Asn Val Leu Ala Trp Leu Tyr Ala Ala Val Ile
3440 3445 3450

Asn Gly Asp Arg Trp Phe Leu Asn Arg Phe Thr Thr Thr Leu Asn
3455 3460 3465

Asp Phe Asn Leu Val Ala Met Lys Tyr Asn Tyr Glu Pro Leu Thr
3470 3475 3480

Gln Asp His Val Asp Ile Leu Gly Pro Leu Ser Ala Gln Thr Gly
3485 3490 3495

Ile Ala Val Leu Asp Met Cys Ala Ala Leu Lys Glu Leu Leu Gln
3500 3505 3510

Asn Gly Met Asn Gly Arg Thr Ile Leu Gly Ser Thr Ile Leu Glu
3515 3520 3525

Asp Glu Phe Thr Pro Phe Asp Val Val Arg Gln Cys Ser Gly Val
3530 3535 3540

Thr Phe Gln Gly Lys Phe Lys Lys Ile Val Lys Gly Thr His His
3545 3550 3555

Trp Met Leu Leu Thr Phe Leu Thr Ser Leu Leu Ile Leu Val Gln
3560 3565 3570

Ser Thr Gln Trp Ser Leu Phe Phe Phe Val Tyr Glu Asn Ala Phe
3575 3580 3585

Leu Pro Phe Thr Leu Gly Ile Met Ala Ile Ala Ala Cys Ala Met
3590 3595 3600

Leu Leu Val Lys His Lys His Ala Phe Leu Cys Leu Phe Leu Leu
3605 3610 3615

Pro Ser Leu Ala Thr Val Ala Tyr Phe Asn Met Val Tyr Met Pro
3620 3625 3630

Ala Ser Trp Val Met Arg Ile Met Thr Trp Leu Glu Leu Ala Asp
3635 3640 3645

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Thr Ser Leu Ser Gly Tyr Arg Leu Lys Asp Cys Val Met Tyr Ala
3650 3655 3660

Ser Ala Leu Val Leu Leu Ile Leu Met Thr Ala Arg Thr Val Tyr
3665 3670 3675

Asp Asp Ala Ala Arg Arg Val Trp Thr Leu Met Asn Val Ile Thr
3680 3685 3690

Leu Val Tyr Lys Val Tyr Tyr Gly Asn Ala Leu Asp Gln Ala Ile
3695 3700 3705

Ser Met Trp Ala Leu Val Ile Ser Val Thr Ser Asn Tyr Ser Gly
3710 3715 3720

Val Val Thr Thr Ile Met Phe Leu Ala Arg Ala Ile Val Phe Val
3725 3730 3735

Cys Val Glu Tyr Tyr Pro Leu Leu Phe Ile Thr Gly Asn Thr Leu
3740 3745 3750

Gln Cys Ile Met Leu Val Tyr Cys Phe Leu Gly Tyr Cys Cys Cys
3755 3760 3765

Cys Tyr Phe Gly Leu Phe Cys Leu Leu Asn Arg Tyr Phe Arg Leu
3770 3775 3780

Thr Leu Gly Val Tyr Asp Tyr Leu Val Ser Thr Gln Glu Phe Arg
3785 3790 3795

Tyr Met Asn Ser Gln Gly Leu Leu Pro Pro Lys Ser Ser Ile Asp
3800 3805 3810

Ala Phe Lys Leu Asn Ile Lys Leu Leu Gly Ile Gly Gly Lys Pro
3815 3820 3825

Cys Ile Lys Val Ala Thr Val Gln Ser Lys Met Ser Asp Val Lys
3830 3835 3840

Cys Thr Ser Val Val Leu Leu Ser Val Leu Gln Gln Leu Arg Val
3845 3850 3855

Glu Ser Ser Ser Lys Leu Trp Ala Gln Cys Val Gln Leu His Asn
3860 3865 3870

Asp Ile Leu Leu Ala Lys Asp Thr Thr Glu Ala Phe Glu Lys Met
3875 3880 3885

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Val	Ser	Leu	Leu	Ser	Val	Leu	Leu	Ser	Met	Gln	Gly	Ala	Val	Asp
	3890					3895					3900			
Ile	Asn	Arg	Leu	Cys	Glu	Glu	Met	Leu	Asp	Asn	Arg	Ala	Thr	Leu
	3905					3910					3915			
Gln	Ala	Ile	Ala	Ser	Glu	Phe	Ser	Ser	Leu	Pro	Ser	Tyr	Ala	Ala
	3920					3925					3930			
Tyr	Ala	Thr	Ala	Gln	Glu	Ala	Tyr	Glu	Gln	Ala	Val	Ala	Asn	Gly
	3935					3940					3945			
Asp	Ser	Glu	Val	Val	Leu	Lys	Lys	Leu	Lys	Lys	Ser	Leu	Asn	Val
	3950					3955					3960			
Ala	Lys	Ser	Glu	Phe	Asp	Arg	Asp	Ala	Ala	Met	Gln	Arg	Lys	Leu
	3965					3970					3975			
Glu	Lys	Met	Ala	Asp	Gln	Ala	Met	Thr	Gln	Met	Tyr	Lys	Gln	Ala
	3980					3985					3990			
Arg	Ser	Glu	Asp	Lys	Arg	Ala	Lys	Val	Thr	Ser	Ala	Met	Gln	Thr
	3995					4000					4005			
Met	Leu	Phe	Thr	Met	Leu	Arg	Lys	Leu	Asp	Asn	Asp	Ala	Leu	Asn
	4010					4015					4020			
Asn	Ile	Ile	Asn	Asn	Ala	Arg	Asp	Gly	Cys	Val	Pro	Leu	Asn	Ile
	4025					4030					4035			
Ile	Pro	Leu	Thr	Thr	Ala	Ala	Lys	Leu	Met	Val	Val	Val	Pro	Asp
	4040					4045					4050			
Tyr	Gly	Thr	Tyr	Lys	Asn	Thr	Cys	Asp	Gly	Asn	Thr	Phe	Thr	Tyr
	4055					4060					4065			
Ala	Ser	Ala	Leu	Trp	Glu	Ile	Gln	Gln	Val	Val	Asp	Ala	Asp	Ser
	4070					4075					4080			
Lys	Ile	Val	Gln	Leu	Ser	Glu	Ile	Asn	Met	Asp	Asn	Ser	Pro	Asn
	4085					4090					4095			
Leu	Ala	Trp	Pro	Leu	Ile	Val	Thr	Ala	Leu	Arg	Ala	Asn	Ser	Ala
	4100					4105					4110			
Val	Lys	Leu	Gln	Asn	Asn	Glu	Leu	Ser	Pro	Val	Ala	Leu	Arg	Gln
	4115					4120					4125			

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Met Ser Cys Ala Ala Gly Thr Thr Gln Thr Ala Cys Thr Asp Asp
4130 4135 4140

Asn Ala Leu Ala Tyr Tyr Asn Asn Ser Lys Gly Gly Arg Phe Val
4145 4150 4155

Leu Ala Leu Leu Ser Asp His Gln Asp Leu Lys Trp Ala Arg Phe
4160 4165 4170

Pro Lys Ser Asp Gly Thr Gly Thr Ile Tyr Thr Glu Leu Glu Pro
4175 4180 4185

Pro Cys Arg Phe Val Thr Asp Thr Pro Lys Gly Pro Lys Val Lys
4190 4195 4200

Tyr Leu Tyr Phe Ile Lys Gly Leu Asn Asn Leu Asn Arg Gly Met
4205 4210 4215

Val Leu Gly Ser Leu Ala Ala Thr Val Arg Leu Gln Ala Gly Asn
4220 4225 4230

Ala Thr Glu Val Pro Ala Asn Ser Thr Val Leu Ser Phe Cys Ala
4235 4240 4245

Phe Ala Val Asp Pro Ala Lys Ala Tyr Lys Asp Tyr Leu Ala Ser
4250 4255 4260

Gly Gly Gln Pro Ile Thr Asn Cys Val Lys Met Leu Cys Thr His
4265 4270 4275

Thr Gly Thr Gly Gln Ala Ile Thr Val Thr Pro Glu Ala Asn Met
4280 4285 4290

Asp Gln Glu Ser Phe Gly Gly Ala Ser Cys Cys Leu Tyr Cys Arg
4295 4300 4305

Cys His Ile Asp His Pro Asn Pro Lys Gly Phe Cys Asp Leu Lys
4310 4315 4320

Gly Lys Tyr Val Gln Ile Pro Thr Thr Cys Ala Asn Asp Pro Val
4325 4330 4335

Gly Phe Thr Leu Arg Asn Thr Val Cys Thr Val Cys Gly Met Trp
4340 4345 4350

Lys Gly Tyr Gly Cys Ser Cys Asp Gln Leu Arg Glu Pro Leu Met

4355

82936-7_seq_28_apr_2004_v1.ST25
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<211> 2697
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 64

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1 5 10 15Thr Gly Thr Ser Thr Asp Val Val Tyr Arg Ala Phe Asp Ile Tyr Asn
20 25 30Glu Lys Val Ala Gly Phe Ala Lys Phe Leu Lys Thr Asn Cys Cys Arg
35 40 45Phe Gln Glu Lys Asp Glu Glu Gly Asn Leu Leu Asp Ser Tyr Phe Val
50 55 60Val Lys Arg His Thr Met Ser Asn Tyr Gln His Glu Glu Thr Ile Tyr
65 70 75 80Asn Leu Val Lys Asp Cys Pro Ala Val Ala Val His Asp Phe Phe Lys
85 90 95Phe Arg Val Asp Gly Asp Met Val Pro His Ile Ser Arg Gln Arg Leu
100 105 110Thr Lys Tyr Thr Met Ala Asp Leu Val Tyr Ala Leu Arg His Phe Asp
115 120 125Glu Gly Asn Cys Asp Thr Leu Lys Glu Ile Leu Val Thr Tyr Asn Cys
130 135 140Cys Asp Asp Asp Tyr Phe Asn Lys Lys Asp Trp Tyr Asp Phe Val Glu
145 150 155 160Asn Pro Asp Ile Leu Arg Val Tyr Ala Asn Leu Gly Glu Arg Val Arg
165 170 175Gln Ser Leu Leu Lys Thr Val Gln Phe Cys Asp Ala Met Arg Asp Ala
180 185 190Gly Ile Val Gly Val Leu Thr Leu Asp Asn Gln Asp Leu Asn Gly Asn
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Trp Tyr Asp Phe Gly Asp Phe Val Gln Val Ala Pro Gly Cys Gly Val
210 215 220

Pro Ile Val Asp Ser Tyr Tyr Ser Leu Leu Met Pro Ile Leu Thr Leu
225 230 235 240

Thr Arg Ala Leu Ala Ala Glu Ser His Met Asp Ala Asp Leu Ala Lys
245 250 255

Pro Leu Ile Lys Trp Asp Leu Leu Lys Tyr Asp Phe Thr Glu Glu Arg
260 265 270

Leu Cys Leu Phe Asp Arg Tyr Phe Lys Tyr Trp Asp Gln Thr Tyr His
275 280 285

Pro Asn Cys Ile Asn Cys Leu Asp Asp Arg Cys Ile Leu His Cys Ala
290 295 300

Asn Phe Asn Val Leu Phe Ser Thr Val Phe Pro Pro Thr Ser Phe Gly
305 310 315 320

Pro Leu Val Arg Lys Ile Phe Val Asp Gly Val Pro Phe Val Val Ser
325 330 335

Thr Gly Tyr His Phe Arg Glu Leu Gly Val Val His Asn Gln Asp Val
340 345 350

Asn Leu His Ser Ser Arg Leu Ser Phe Lys Glu Leu Leu Val Tyr Ala
355 360 365

Ala Asp Pro Ala Met His Ala Ala Ser Gly Asn Leu Leu Leu Asp Lys
370 375 380

Arg Thr Thr Cys Phe Ser Val Ala Ala Leu Thr Asn Asn Val Ala Phe
385 390 395 400

Gln Thr Val Lys Pro Gly Asn Phe Asn Lys Asp Phe Tyr Asp Phe Ala
405 410 415

Val Ser Lys Gly Phe Phe Lys Glu Gly Ser Ser Val Glu Leu Lys His
420 425 430

Phe Phe Phe Ala Gln Asp Gly Asn Ala Ala Ile Ser Asp Tyr Asp Tyr
435 440 445

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Tyr Arg Tyr Asn Leu Pro Thr Met Cys Asp Ile Arg Gln Leu Leu Phe
 450 455 460

Val Val Glu Val Val Asp Lys Tyr Phe Asp Cys Tyr Asp Gly Gly Cys
 465 470 475 480

Ile Asn Ala Asn Gln Val Ile Val Asn Asn Leu Asp Lys Ser Ala Gly
 485 490 495

Phe Pro Phe Asn Lys Trp Gly Lys Ala Arg Leu Tyr Tyr Asp Ser Met
 500 505 510

Ser Tyr Glu Asp Gln Asp Ala Leu Phe Ala Tyr Thr Lys Arg Asn Val
 515 520 525

Ile Pro Thr Ile Thr Gln Met Asn Leu Lys Tyr Ala Ile Ser Ala Lys
 530 535 540

Asn Arg Ala Arg Thr Val Ala Gly Val Ser Ile Cys Ser Thr Met Thr
 545 550 555 560

Asn Arg Gln Phe His Gln Lys Leu Leu Lys Ser Ile Ala Ala Thr Arg
 565 570 575

Gly Ala Thr Val Val Ile Gly Thr Ser Lys Phe Tyr Gly Gly Trp His
 580 585 590

Asn Met Leu Lys Thr Val Tyr Ser Asp Val Glu Thr Pro His Leu Met
 595 600 605

Gly Trp Asp Tyr Pro Lys Cys Asp Arg Ala Met Pro Asn Met Leu Arg
 610 615 620

Ile Met Ala Ser Leu Val Leu Ala Arg Lys His Asn Thr Cys Cys Asn
 625 630 635 640

Leu Ser His Arg Phe Tyr Arg Leu Ala Asn Glu Cys Ala Gln Val Leu
 645 650 655

Ser Glu Met Val Met Cys Gly Gly Ser Leu Tyr Val Lys Pro Gly Gly
 660 665 670

Thr Ser Ser Gly Asp Ala Thr Thr Ala Tyr Ala Asn Ser Val Phe Asn
 675 680 685

Ile Cys Gln Ala Val Thr Ala Asn Val Asn Ala Leu Leu Ser Thr Asp
 690 695 700

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Gly Asn Lys Ile Ala Asp Lys Tyr Val Arg Asn Leu Gln His Arg Leu
705 710 715 720

Tyr Glu Cys Leu Tyr Arg Asn Arg Asp Val Asp His Glu Phe Val Asp
725 730 735

Glu Phe Tyr Ala Tyr Leu Arg Lys His Phe Ser Met Met Ile Leu Ser
740 745 750

Asp Asp Ala Val Val Cys Tyr Asn Ser Asn Tyr Ala Ala Gln Gly Leu
755 760 765

Val Ala Ser Ile Lys Asn Phe Lys Ala Val Leu Tyr Tyr Gln Asn Asn
770 775 780

Val Phe Met Ser Glu Ala Lys Cys Trp Thr Glu Thr Asp Leu Thr Lys
785 790 795 800

Gly Pro His Glu Phe Cys Ser Gln His Thr Met Leu Val Lys Gln Gly
805 810 815

Asp Asp Tyr Val Tyr Leu Pro Tyr Pro Asp Pro Ser Arg Ile Leu Gly
820 825 830

Ala Gly Cys Phe Val Asp Asp Ile Val Lys Thr Asp Gly Thr Leu Met
835 840 845

Ile Glu Arg Phe Val Ser Leu Ala Ile Asp Ala Tyr Pro Leu Thr Lys
850 855 860

His Pro Asn Gln Glu Tyr Ala Asp Val Phe His Leu Tyr Leu Gln Tyr
865 870 875 880

Ile Arg Lys Leu His Asp Glu Leu Thr Gly His Met Leu Asp Met Tyr
885 890 895

Ser Val Met Leu Thr Asn Asp Asn Thr Ser Arg Tyr Trp Glu Pro Glu
900 905 910

Phe Tyr Glu Ala Met Tyr Thr Pro His Thr Val Leu Gln Ala Val Gly
915 920 925

Ala Cys Val Leu Cys Asn Ser Gln Thr Ser Leu Arg Cys Gly Ala Cys
930 935 940

Ile Arg Arg Pro Phe Leu Cys Cys Lys Cys Cys Tyr Asp His Val Ile
945 950 955 960

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Ser Thr Ser His Lys Leu Val Leu Ser Val Asn Pro Tyr Val Cys Asn
965 970 975

Ala Pro Gly Cys Asp Val Thr Asp Val Thr Gln Leu Tyr Leu Gly Gly
980 985 990

Met Ser Tyr Tyr Cys Lys Ser His Lys Pro Pro Ile Ser Phe Pro Leu
995 1000 1005

Cys Ala Asn Gly Gln Val Phe Gly Leu Tyr Lys Asn Thr Cys Val
1010 1015 1020

Gly Ser Asp Asn Val Thr Asp Phe Asn Ala Ile Ala Thr Cys Asp
1025 1030 1035

Trp Thr Asn Ala Gly Asp Tyr Ile Leu Ala Asn Thr Cys Thr Glu
1040 1045 1050

Arg Leu Lys Leu Phe Ala Ala Glu Thr Leu Lys Ala Thr Glu Glu
1055 1060 1065

Thr Phe Lys Leu Ser Tyr Gly Ile Ala Thr Val Arg Glu Val Leu
1070 1075 1080

Ser Asp Arg Glu Leu His Leu Ser Trp Glu Val Gly Lys Pro Arg
1085 1090 1095

Pro Pro Leu Asn Arg Asn Tyr Val Phe Thr Gly Tyr Arg Val Thr
1100 1105 1110

Lys Asn Ser Lys Val Gln Ile Gly Glu Tyr Thr Phe Glu Lys Gly
1115 1120 1125

Asp Tyr Gly Asp Ala Val Val Tyr Arg Gly Thr Thr Thr Tyr Lys
1130 1135 1140

Leu Asn Val Gly Asp Tyr Phe Val Leu Thr Ser His Thr Val Met
1145 1150 1155

Pro Leu Ser Ala Pro Thr Leu Val Pro Gln Glu His Tyr Val Arg
1160 1165 1170

Ile Thr Gly Leu Tyr Pro Thr Leu Asn Ile Ser Asp Glu Phe Ser
1175 1180 1185

Ser Asn Val Ala Asn Tyr Gln Lys Val Gly Met Gln Lys Tyr Ser
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1190

Thr	Leu	Gln	Gly	Pro	Pro	Gly	Thr	Gly	Lys	Ser	His	Phe	Ala	Ile
1205						1210					1215			
Gly	Leu	Ala	Leu	Tyr	Tyr	Pro	Ser	Ala	Arg	Ile	Val	Tyr	Thr	Ala
1220						1225					1230			
Cys	Ser	His	Ala	Ala	Val	Asp	Ala	Leu	Cys	Glu	Lys	Ala	Leu	Lys
1235						1240					1245			
Tyr	Leu	Pro	Ile	Asp	Lys	Cys	Ser	Arg	Ile	Ile	Pro	Ala	Arg	Ala
1250						1255					1260			
Arg	Val	Glu	Cys	Phe	Asp	Lys	Phe	Lys	Val	Asn	Ser	Thr	Leu	Glu
1265						1270					1275			
Gln	Tyr	Val	Phe	Cys	Thr	Val	Asn	Ala	Leu	Pro	Glu	Thr	Thr	Ala
1280						1285					1290			
Asp	Ile	Val	Val	Phe	Asp	Glu	Ile	Ser	Met	Ala	Thr	Asn	Tyr	Asp
1295						1300					1305			
Leu	Ser	Val	Val	Asn	Ala	Arg	Leu	Arg	Ala	Lys	His	Tyr	Val	Tyr
1310						1315					1320			
Ile	Gly	Asp	Pro	Ala	Gln	Leu	Pro	Ala	Pro	Arg	Thr	Leu	Leu	Thr
1325						1330					1335			
Lys	Gly	Thr	Leu	Glu	Pro	Glu	Tyr	Phe	Asn	Ser	Val	Cys	Arg	Leu
1340						1345					1350			
Met	Lys	Thr	Ile	Gly	Pro	Asp	Met	Phe	Leu	Gly	Thr	Cys	Arg	Arg
1355						1360					1365			
Cys	Pro	Ala	Glu	Ile	Val	Asp	Thr	Val	Ser	Ala	Leu	Val	Tyr	Asp
1370						1375					1380			
Asn	Lys	Leu	Lys	Ala	His	Lys	Asp	Lys	Ser	Ala	Gln	Cys	Phe	Lys
1385						1390					1395			
Met	Phe	Tyr	Lys	Gly	Val	Ile	Thr	His	Asp	Val	Ser	Ser	Ala	Ile
1400						1405					1410			
Asn	Arg	Pro	Gln	Ile	Gly	Val	Val	Arg	Glu	Phe	Leu	Thr	Arg	Asn
1415						1420					1425			

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Pro Ala Trp Arg Lys Ala Val Phe Ile Ser Pro Tyr Asn Ser Gln
 1430 1435 1440
 Asn Ala Val Ala Ser Lys Ile Leu Gly Leu Pro Thr Gln Thr Val
 1445 1450 1455
 Asp Ser Ser Gln Gly Ser Glu Tyr Asp Tyr Val Ile Phe Thr Gln
 1460 1465 1470
 Thr Thr Glu Thr Ala His Ser Cys Asn Val Asn Arg Phe Asn Val
 1475 1480 1485
 Ala Ile Thr Arg Ala Lys Ile Gly Ile Leu Cys Ile Met Ser Asp
 1490 1495 1500
 Arg Asp Leu Tyr Asp Lys Leu Gln Phe Thr Ser Leu Glu Ile Pro
 1505 1510 1515
 Arg Arg Asn Val Ala Thr Leu Gln Ala Glu Asn Val Thr Gly Leu
 1520 1525 1530
 Phe Lys Asp Cys Ser Lys Ile Ile Thr Gly Leu His Pro Thr Gln
 1535 1540 1545
 Ala Pro Thr His Leu Ser Val Asp Ile Lys Phe Lys Thr Glu Gly
 1550 1555 1560
 Leu Cys Val Asp Ile Pro Gly Ile Pro Lys Asp Met Thr Tyr Arg
 1565 1570 1575
 Arg Leu Ile Ser Met Met Gly Phe Lys Met Asn Tyr Gln Val Asn
 1580 1585 1590
 Gly Tyr Pro Asn Met Phe Ile Thr Arg Glu Glu Ala Ile Arg His
 1595 1600 1605
 Val Arg Ala Trp Ile Gly Phe Asp Val Glu Gly Cys His Ala Thr
 1610 1615 1620
 Arg Asp Ala Val Gly Thr Asn Leu Pro Leu Gln Leu Gly Phe Ser
 1625 1630 1635
 Thr Gly Val Asn Leu Val Ala Val Pro Thr Gly Tyr Val Asp Thr
 1640 1645 1650
 Glu Asn Asn Thr Glu Phe Thr Arg Val Asn Ala Lys Pro Pro Pro
 1655 1660 1665

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Gly	Asp	Gln	Phe	Lys	His	Leu	Ile	Pro	Leu	Met	Tyr	Lys	Gly	Leu
	1670					1675					1680			
Pro	Trp	Asn	Val	Val	Arg	Ile	Lys	Ile	Val	Gln	Met	Leu	Ser	Asp
	1685					1690					1695			
Thr	Leu	Lys	Gly	Leu	Ser	Asp	Arg	Val	Val	Phe	Val	Leu	Trp	Ala
	1700					1705					1710			
His	Gly	Phe	Glu	Leu	Thr	Ser	Met	Lys	Tyr	Phe	Val	Lys	Ile	Gly
	1715					1720					1725			
Pro	Glu	Arg	Thr	Cys	Cys	Leu	Cys	Asp	Lys	Arg	Ala	Thr	Cys	Phe
	1730					1735					1740			
Ser	Thr	Ser	Ser	Asp	Thr	Tyr	Ala	Cys	Trp	Asn	His	Ser	Val	Gly
	1745					1750					1755			
Phe	Asp	Tyr	Val	Tyr	Asn	Pro	Phe	Met	Ile	Asp	Val	Gln	Gln	Trp
	1760					1765					1770			
Gly	Phe	Thr	Gly	Asn	Leu	Gln	Ser	Asn	His	Asp	Gln	His	Cys	Gln
	1775					1780					1785			
Val	His	Gly	Asn	Ala	His	Val	Ala	Ser	Cys	Asp	Ala	Ile	Met	Thr
	1790					1795					1800			
Arg	Cys	Leu	Ala	Val	His	Glu	Cys	Phe	Val	Lys	Arg	Val	Asp	Trp
	1805					1810					1815			
Ser	Val	Glu	Tyr	Pro	Ile	Ile	Gly	Asp	Glu	Leu	Arg	Val	Asn	Ser
	1820					1825					1830			
Ala	Cys	Arg	Lys	Val	Gln	His	Met	Val	Val	Lys	Ser	Ala	Leu	Leu
	1835					1840					1845			
Ala	Asp	Lys	Phe	Pro	Val	Leu	His	Asp	Ile	Gly	Asn	Pro	Lys	Ala
	1850					1855					1860			
Ile	Lys	Cys	Val	Pro	Gln	Ala	Glu	Val	Glu	Trp	Lys	Phe	Tyr	Asp
	1865					1870					1875			
Ala	Gln	Pro	Cys	Ser	Asp	Lys	Ala	Tyr	Lys	Ile	Glu	Glu	Leu	Phe
	1880					1885					1890			
Tyr	Ser	Tyr	Ala	Thr	His	His	Asp	Lys	Phe	Thr	Asp	Gly	Val	Cys
	1895					1900					1905			

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Leu	Phe	Trp	Asn	Cys	Asn	Val	Asp	Arg	Tyr	Pro	Ala	Asn	Ala	Ile
	1910					1915					1920			
Val	Cys	Arg	Phe	Asp	Thr	Arg	Val	Leu	Ser	Asn	Leu	Asn	Leu	Pro
	1925					1930					1935			
Gly	Cys	Asp	Gly	Gly	Ser	Leu	Tyr	Val	Asn	Lys	His	Ala	Phe	His
	1940					1945					1950			
Thr	Pro	Ala	Phe	Asp	Lys	Ser	Ala	Phe	Thr	Asn	Leu	Lys	Gln	Leu
	1955					1960					1965			
Pro	Phe	Phe	Tyr	Tyr	Ser	Asp	Ser	Pro	Cys	Glu	Ser	His	Gly	Lys
	1970					1975					1980			
Gln	Val	Val	Ser	Asp	Ile	Asp	Tyr	Val	Pro	Leu	Lys	Ser	Ala	Thr
	1985					1990					1995			
Cys	Ile	Thr	Arg	Cys	Asn	Leu	Gly	Gly	Ala	Val	Cys	Arg	His	His
	2000					2005					2010			
Ala	Asn	Glu	Tyr	Arg	Gln	Tyr	Leu	Asp	Ala	Tyr	Asn	Met	Met	Ile
	2015					2020					2025			
Ser	Ala	Gly	Phe	Ser	Leu	Trp	Ile	Tyr	Lys	Gln	Phe	Asp	Thr	Tyr
	2030					2035					2040			
Asn	Leu	Trp	Asn	Thr	Phe	Thr	Arg	Leu	Gln	Ser	Leu	Glu	Asn	Val
	2045					2050					2055			
Ala	Tyr	Asn	Val	Val	Asn	Lys	Gly	His	Phe	Asp	Gly	His	Ala	Gly
	2060					2065					2070			
Glu	Ala	Pro	Val	Ser	Ile	Ile	Asn	Asn	Ala	Val	Tyr	Thr	Lys	Val
	2075					2080					2085			
Asp	Gly	Ile	Asp	Val	Glu	Ile	Phe	Glu	Asn	Lys	Thr	Thr	Leu	Pro
	2090					2095					2100			
Val	Asn	Val	Ala	Phe	Glu	Leu	Trp	Ala	Lys	Arg	Asn	Ile	Lys	Pro
	2105					2110					2115			
Val	Pro	Glu	Ile	Lys	Ile	Leu	Asn	Asn	Leu	Gly	Val	Asp	Ile	Ala
	2120					2125					2130			
Ala	Asn	Thr	Val	Ile	Trp	Asp	Tyr	Lys	Arg	Glu	Ala	Pro	Ala	His

2135

val	Ser	Thr	Ile	Gly	val	Cys	Thr	Met	Thr	Asp	Ile	Ala	Lys	Lys
2150						2155					2160			
Pro	Thr	Glu	Ser	Ala	Cys	Ser	Ser	Leu	Thr	Val	Leu	Phe	Asp	Gly
2165						2170					2175			
Arg	Val	Glu	Gly	Gln	Val	Asp	Leu	Phe	Arg	Asn	Ala	Arg	Asn	Gly
2180						2185					2190			
Val	Leu	Ile	Thr	Glu	Gly	Ser	Val	Lys	Gly	Leu	Thr	Pro	Ser	Lys
2195						2200					2205			
Gly	Pro	Ala	Gln	Ala	Ser	Val	Asn	Gly	Val	Thr	Leu	Ile	Gly	Glu
2210						2215					2220			
Ser	Val	Lys	Thr	Gln	Phe	Asn	Tyr	Phe	Lys	Lys	Val	Asp	Gly	Ile
2225						2230					2235			
Ile	Gln	Gln	Leu	Pro	Glu	Thr	Tyr	Phe	Thr	Gln	Ser	Arg	Asp	Leu
2240						2245					2250			
Glu	Asp	Phe	Lys	Pro	Arg	Ser	Gln	Met	Glu	Thr	Asp	Phe	Leu	Glu
2255						2260					2265			
Leu	Ala	Met	Asp	Glu	Phe	Ile	Gln	Arg	Tyr	Lys	Leu	Glu	Gly	Tyr
2270						2275					2280			
Ala	Phe	Glu	His	Ile	Val	Tyr	Gly	Asp	Phe	Ser	His	Gly	Gln	Leu
2285						2290					2295			
Gly	Gly	Leu	His	Leu	Met	Ile	Gly	Leu	Ala	Lys	Arg	Ser	Gln	Asp
2300						2305					2310			
Ser	Pro	Leu	Lys	Leu	Glu	Asp	Phe	Ile	Pro	Met	Asp	Ser	Thr	Val
2315						2320					2325			
Lys	Asn	Tyr	Phe	Ile	Thr	Asp	Ala	Gln	Thr	Gly	Ser	Ser	Lys	Cys
2330						2335					2340			
Val	Cys	Ser	Val	Ile	Asp	Leu	Leu	Leu	Asp	Asp	Phe	Val	Glu	Ile
2345						2350					2355			
Ile	Lys	Ser	Gln	Asp	Leu	Ser	Val	Ile	Ser	Lys	Val	Val	Lys	Val
2360						2365					2370			

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Thr Ile Asp Tyr Ala Glu Ile Ser Phe Met Leu Trp Cys Lys Asp
 2375 2380 2385
 Gly His Val Glu Thr Phe Tyr Pro Lys Leu Gln Ala Ser Gln Ala
 2390 2395 2400
 Trp Gln Pro Gly Val Ala Met Pro Asn Leu Tyr Lys Met Gln Arg
 2405 2410 2415
 Met Leu Leu Glu Lys Cys Asp Leu Gln Asn Tyr Gly Glu Asn Ala
 2420 2425 2430
 Val Ile Pro Lys Gly Ile Met Met Asn Val Ala Lys Tyr Thr Gln
 2435 2440 2445
 Leu Cys Gln Tyr Leu Asn Thr Leu Thr Leu Ala Val Pro Tyr Asn
 2450 2455 2460
 Met Arg Val Ile His Phe Gly Ala Gly Ser Asp Lys Gly Val Ala
 2465 2470 2475
 Pro Gly Thr Ala Val Leu Arg Gln Trp Leu Pro Thr Gly Thr Leu
 2480 2485 2490
 Leu Val Asp Ser Asp Leu Asn Asp Phe Val Ser Asp Ala Asp Ser
 2495 2500 2505
 Thr Leu Ile Gly Asp Cys Ala Thr Val His Thr Ala Asn Lys Trp
 2510 2515 2520
 Asp Leu Ile Ile Ser Asp Met Tyr Asp Pro Arg Thr Lys His Val
 2525 2530 2535
 Thr Lys Glu Asn Asp Ser Lys Glu Gly Phe Phe Thr Tyr Leu Cys
 2540 2545 2550
 Gly Phe Ile Lys Gln Lys Leu Ala Leu Gly Gly Ser Ile Ala Val
 2555 2560 2565
 Lys Ile Thr Glu His Ser Trp Asn Ala Asp Leu Tyr Lys Leu Met
 2570 2575 2580
 Gly His Phe Ser Trp Trp Thr Ala Phe Val Thr Asn Val Asn Ala
 2585 2590 2595
 Ser Ser Ser Glu Ala Phe Leu Ile Gly Ala Asn Tyr Leu Gly Lys
 2600 2605 2610

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Pro Lys Glu Gln Ile Asp Gly Tyr Thr Met His Ala Asn Tyr Ile
2615 2620 2625

Phe Trp Arg Asn Thr Asn Pro Ile Gln Leu Ser Ser Tyr Ser Leu
2630 2635 2640

Phe Asp Met Ser Lys Phe Pro Leu Lys Leu Arg Gly Thr Ala Val
2645 2650 2655

Met Ser Leu Lys Glu Asn Gln Ile Asn Asp Met Ile Tyr Ser Leu
2660 2665 2670

Leu Glu Lys Gly Arg Leu Ile Ile Arg Glu Asn Asn Arg Val Val
2675 2680 2685

Val Ser Ser Asp Ile Leu Val Asn Asn
2690 2695

<210> 65
<211> 274
<212> PRT
<213> Severe acute respiratory syndrome virus
<400> 65

Met Asp Leu Phe Met Arg Phe Phe Thr Leu Arg Ser Ile Thr Ala Gln
1 5 10 15

Pro Val Lys Ile Asp Asn Ala Ser Pro Ala Ser Thr Val His Ala Thr
20 25 30

Ala Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly Trp Leu Val Ile
35 40 45

Gly Val Ala Phe Leu Ala Val Phe Gln Ser Ala Thr Lys Ile Ile Ala
50 55 60

Leu Asn Lys Arg Trp Gln Leu Ala Leu Tyr Lys Gly Phe Gln Phe Ile
65 70 75 80

Cys Asn Leu Leu Leu Leu Phe Val Thr Ile Tyr Ser His Leu Leu Leu
85 90 95

Val Ala Ala Gly Met Glu Ala Gln Phe Leu Tyr Leu Tyr Ala Leu Ile
100 105 110

Tyr Phe Leu Gln Cys Ile Asn Ala Cys Arg Ile Ile Met Arg Cys Trp
115 120 125

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Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu Tyr Asp Ala Asn
130 135 140

Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr Cys Ile Pro Tyr
145 150 155 160

Asn Ser Val Thr Asp Thr Ile Val Val Thr Glu Gly Asp Gly Ile Ser
165 170 175

Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly Tyr Ser Glu Asp
180 185 190

Arg His Ser Gly Val Lys Asp Tyr Val Val Val His Gly Tyr Phe Thr
195 200 205

Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr Thr Asp Thr Gly
210 215 220

Ile Glu Asn Ala Thr Phe Phe Ile Phe Asn Lys Leu Val Lys Asp Pro
225 230 235 240

Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser Gly Val Ala Asn
245 250 255

Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr Thr Thr Ser Val
260 265 270

Pro Leu

<210> 66
<211> 154
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 66

Met Met Pro Thr Thr Leu Phe Ala Gly Thr His Ile Thr Met Thr Thr
1 5 10 15

Val Tyr His Ile Thr Val Ser Gln Ile Gln Leu Ser Leu Leu Lys Val
20 25 30

Thr Ala Phe Gln His Gln Asn Ser Lys Lys Thr Thr Lys Leu Val Val
35 40 45

Ile Leu Arg Ile Gly Thr Gln Val Leu Lys Thr Met Ser Leu Tyr Met
50 55 60

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Ala Ile Ser Pro Lys Phe Thr Thr Ser Leu Ser Leu His Lys Leu Leu
65 70 75 80

Gln Thr Leu Val Leu Lys Met Leu His Ser Ser Ser Leu Thr Ser Leu
85 90 95

Leu Lys Thr His Arg Met Cys Lys Tyr Thr Gln Ser Thr Ala Leu Gln
100 105 110

Glu Leu Leu Ile Gln Gln Trp Ile Gln Phe Met Met Ser Arg Arg Arg
115 120 125

Leu Leu Ala Cys Leu Cys Lys His Lys Lys Val Ser Thr Asn Leu Cys
130 135 140

Thr His Ser Phe Arg Lys Lys Gln Val Arg
145 150

<210> 67
<211> 63
<212> PRT
<213> Severe acute respiratory syndrome virus
<400> 67

Met Phe His Leu Val Asp Phe Gln Val Thr Ile Ala Glu Ile Leu Ile
1 5 10 15

Ile Ile Met Arg Thr Phe Arg Ile Ala Ile Trp Asn Leu Asp Val Ile
20 25 30

Ile Ser Ser Ile Val Arg Gln Leu Phe Lys Pro Leu Thr Lys Lys Asn
35 40 45

Tyr Ser Glu Leu Asp Asp Glu Glu Pro Met Glu Leu Asp Tyr Pro
50 55 60

<210> 68
<211> 122
<212> PRT
<213> Severe acute respiratory syndrome virus
<400> 68

Met Lys Ile Ile Leu Phe Leu Thr Leu Ile Val Phe Thr Ser Cys Glu
1 5 10 15

Leu Tyr His Tyr Gln Glu Cys Val Arg Gly Thr Thr Val Leu Leu Lys
20 25 30

Glu Pro Cys Pro Ser Gly Thr Tyr Glu Gly Asn Ser Pro Phe His Pro
 35 40 45

Leu Ala Asp Asn Lys Phe Ala Leu Thr Cys Thr Ser Thr His Phe Ala
 50 55 60

Phe Ala Cys Ala Asp Gly Thr Arg His Thr Tyr Gln Leu Arg Ala Arg
 65 70 75 80

Ser Val Ser Pro Lys Leu Phe Ile Arg Gln Glu Glu Val Gln Gln Glu
 85 90 95

Leu Tyr Ser Pro Leu Phe Leu Ile Val Ala Ala Leu Val Phe Leu Ile
 100 105 110

Leu Cys Phe Thr Ile Lys Arg Lys Thr Glu
 115 120

<210> 69
 <211> 44
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 69

Met Asn Glu Leu Thr Leu Ile Asp Phe Tyr Leu Cys Phe Leu Ala Phe
 1 5 10 15

Leu Leu Phe Leu Val Leu Ile Met Leu Ile Ile Phe Trp Phe Ser Leu
 20 25 30

Glu Ile Gln Asp Leu Glu Glu Pro Cys Thr Lys Val
 35 40

<210> 70
 <211> 39
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 70

Met Lys Leu Leu Ile Val Leu Thr Cys Ile Ser Leu Cys Ser Cys Ile
 1 5 10 15

Cys Thr Val Val Gln Arg Cys Ala Ser Asn Lys Pro His Val Leu Glu
 20 25 30

Asp Pro Cys Lys Val Gln His
 35

<210> 71

<211> 84
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 71

Met Cys Leu Lys Ile Leu Val Arg Tyr Asn Thr Arg Gly Asn Thr Tyr
 1 5 10 15

Ser Thr Ala Trp Leu Cys Ala Leu Gly Lys Val Leu Pro Phe His Arg
 20 25 30

Trp His Thr Met Val Gln Thr Cys Thr Pro Asn Val Thr Ile Asn Cys
 35 40 45

Gln Asp Pro Ala Gly Gly Ala Leu Ile Ala Arg Cys Trp Tyr Leu His
 50 55 60

Glu Gly His Gln Thr Ala Ala Phe Arg Asp Val Leu Val Val Leu Asn
 65 70 75 80

Lys Arg Thr Asn

<210> 72
 <211> 98
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 72

Met Asp Pro Asn Gln Thr Asn Val Val Pro Pro Ala Leu His Leu Val
 1 5 10 15

Asp Pro Gln Ile Gln Leu Thr Ile Thr Arg Met Glu Asp Ala Met Gly
 20 25 30

Gln Gly Gln Asn Ser Ala Asp Pro Lys Val Tyr Pro Ile Ile Leu Arg
 35 40 45

Leu Gly Ser Gln Leu Ser Leu Ser Met Ala Arg Arg Asn Leu Asp Ser
 50 55 60

Leu Glu Ala Arg Ala Phe Gln Ser Thr Pro Ile Val Val Gln Met Thr
 65 70 75 80

Lys Leu Ala Thr Thr Glu Glu Leu Pro Asp Glu Phe Val Val Val Thr
 85 90 95

Ala Lys

<210> 73
 <211> 70
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 73

Met Leu Pro Pro Cys Tyr Asn Phe Leu Lys Glu Gln His Cys Gln Lys
 1 5 10 15

Ala Ser Thr Gln Arg Glu Ala Glu Ala Ala Val Lys Pro Leu Leu Ala
 20 25 30

Pro His His Val Val Ala Val Ile Gln Glu Ile Gln Leu Leu Ala Ala
 35 40 45

Val Gly Glu Ile Leu Leu Leu Glu Trp Leu Ala Glu Val Val Lys Leu
 50 55 60

Pro Ser Arg Tyr Cys Cys
 65 70

<210> 74
 <211> 6
 <212> RNA
 <213> Coronavirus

<400> 74
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6

<210> 75
 <211> 13
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 75

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly
 1 5 10

<210> 76
 <211> 23
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 76

Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly Trp Leu Val Ile Gly
 1 5 10 15

Val Ala Phe Leu Ala Val Phe
 20

<210> 77
 <211> 23
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 77

Phe Gln Phe Ile Cys Asn Leu Leu Leu Leu Phe Val Thr Ile Tyr Ser
 1 5 10 15

His Leu Leu Leu Val Ala Ala
 20

<210> 78
 <211> 23
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 78

Ala Gln Phe Leu Tyr Leu Tyr Ala Leu Ile Tyr Phe Leu Gln Cys Ile
 1 5 10 15

Asn Ala Cys Arg Ile Ile Met
 20

<210> 79
 <211> 18
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 79

Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
 1 5 10 15

Ile Leu

<210> 80
 <211> 23
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 80

Leu Leu Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp
 1 5 10 15

Ile Met Leu Leu Gln Phe Ala
 20

<210> 81
 <211> 23

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<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 81

Leu Val Phe Leu Trp Leu Leu Trp Pro Val Thr Leu Ala Cys Phe Val
1 5 10 15

Leu Ala Ala Val Tyr Arg Ile
20

<210> 82
<211> 23
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 82

Gly Gly Ile Ala Ile Ala Met Ala Cys Ile Val Gly Leu Met Trp Leu
1 5 10 15

Ser Tyr Phe Val Ala Ser Phe
20

<210> 83
<211> 20
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 83

His Leu Val Asp Phe Gln Val Thr Ile Ala Glu Ile Leu Ile Ile Ile
1 5 10 15

Met Arg Thr Phe
20

<210> 84
<211> 15
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 84

Met Lys Ile Ile Leu Phe Leu Thr Leu Ile Val Phe Thr Ser Cys
1 5 10 15

<210> 85
<211> 19
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 85

Ser Pro Leu Phe Leu Ile Val Ala Ala Leu Val Phe Leu Ile Leu Cys
1 5 10 15

Phe Thr Ile

<210> 86
 <211> 83
 <212> PRT
 <213> Severe acute respiratory syndrome virus
 <400> 86

Glu Leu Tyr His Tyr Gln Glu Cys Val Arg Gly Thr Thr Val Leu Leu
 1 5 10 15

Lys Glu Pro Cys Pro Ser Gly Thr Tyr Glu Gly Asn Ser Pro Phe His
 20 25 30

Pro Leu Ala Asp Asn Lys Phe Ala Leu Thr Cys Thr Ser Thr His Phe
 35 40 45

Ala Phe Ala Cys Ala Asp Gly Thr Arg His Thr Tyr Gln Leu Arg Ala
 50 55 60

Arg Ser Val Ser Pro Lys Leu Phe Ile Arg Gln Glu Glu Val Gln Gln
 65 70 75 80

Glu Leu Tyr

<210> 87
 <211> 37
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 87
 caggaaacag ctatgacacc aagaacaagg ctctcca

37

<210> 88
 <211> 37
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 88
 caggaaacag ctatgacgat agggcctctt ccacaga

37

<210> 89
 <211> 496

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<212> DNA
 <213> Severe acute respiratory syndrome virus

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is a, c, g, or t

<400> 89
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 ataataaatt ttactgtcgt tgacaagaaa cgagtaactc gtccctcttc tgcagactgc 180
 ttacggtttc gtccgtgttg cagtcgatca tcagcatacc taggtttcgt ccgggtgtga 240
 ccgaaaggta agatggagag ccttgttctt ggtgtcaacg agaaaacaca cgtccaactc 300
 agtttgcttg tccttcaggt tagagacgtg ctagtgctg gcttcgggga ctctgtggaa 360
 gaggccctat cggaggcacg tgaacacctc aaaaatggca cttgtggtct agtagagctg 420
 gaaaaaggcg tactgcccc a gcttgaacag ccctatgtgt tcattaaacg ttctgatgcc 480
 ttaagcacca atcacg 496

<210> 90
 <211> 523
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 90
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 gcacgcgcgg gcaagtcaat gtgcactctt tccgaacaac ttgattacat cgagtcgaag 120
 agagggtgtct actgctgccg tgaccatgag catgaaattg cctgggttcac tgagcgctct 180
 gataagagct acgagcacca gacacccttc gaaattaaga gtgccaagaa atttgacact 240
 ttcaaagggg aatgcccaaa gtttgtgttt cctcttaact caaaagtcaa agtcattcaa 300
 ccacgtgttg aaaagaaaaa gactgagggt ttcattggggc gtatacgctc tgtgtaccct 360
 gttgcatctc cacaggagtg taacaatatg cacttgtcta cttgatgaa atgtaatcat 420
 tgcgatgaag tttcatggca gacgtgacgac tttctgaaag ccacttgtga acattgtggc 480
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<210> 91
 <211> 324
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 91
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<210> 92
 <211> 495
 <212> DNA
 <213> Severe acute respiratory syndrome virus

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tcgtgaacgt gttaacatta acattgttgg cgattttcat ttgaatgaag aggttgccat	180
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gcccgtaaaa ggtgcttgga acattggaca acagagatca gttttaacac cactgtgtgg	360
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acagtcatta cgtct	495

<210> 93
 <211> 486
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 93	
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ctgatattgg ctcaggccat actggcatta ctggtgacaa tgtggagacc ttgaatgagg	180
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ataaagttac caagggaaag cccgtaaaag gtgcttgga cattggacaa cagagatcag	420
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cgcgca	486

<210> 94
 <211> 567
 <212> DNA

<213> Severe acute respiratory syndrome virus

<400> 94

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caagaacggt gaactcgaag cactcgagac gcccgttgat agcttcacaa atggagctat	480
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<210> 95

<211> 516

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 95

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cacatgacac agtacttacc tctgaggagg ttgtttctcaa gaacggtgaa ctcgaagcac	360
tcgagacgcc cgttgatagc ttcacaaatg gagctatcgt tggcacacca gtctgtgtaa	420
atggcctcat gctcttagag attaaggaca aagaacaata ctgcgcattg tctcctgggt	480
tactggctac aaacaatgtc tttcgcttaa aagggg	516

<210> 96

<211> 448

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 96

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aaaacttact gacaatgttg ccattaaatg tgttgacatc gttaaggagg caciaagtgc	180
taatcctatg gtgattgtaa atgctgctaa catacacctg aaacatgggtg gtgggtgtagc	240

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ggcagcatat gaaaatttca attcacag 448

<210> 97
<211> 333
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 97
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caacaaggca accaatggtg ccatgcaaaa gga 333

<210> 98
<211> 399
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 98
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<210> 99
<211> 437
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 99
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<210> 100
 <211> 569
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 100
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 attactgcat aagccaattg tttggcacat taaccaggct acaaccaaga caacgttcaa 480
 accaaacact tgggtgtttac gttgtctttg gagtacaaag ccagtagata cttcaaattc 540
 atttgaagtt ctggcagtag aagacacat 569

<210> 101
 <211> 187
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 101
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 aatcttgctt gtgaaagtca acaaccacc tctgaagaag tagtggaata tcctaccata 120
 cagaaggaag tcatagagcg tgacgtgaaa actaccgaag ttgtaggcaa tgcataactt 180
 aaaccat 187

<210> 102
 <211> 271
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 102
 aaatgcgacg agtctgcttc taagtctgct tctgtgtact acagtcagct gatgtgccaa 60
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 ggtgtccttt ctacattcgt gtcagctgcc c 271

<210> 103
 <211> 363
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 103
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 ttt 363

<210> 104
 <211> 500
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 104
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 ggtttggttat atcgttatgc cagtacatac attgtcaatc catgatgggt acacaaatga 360
 aatcattggt taaaagcca ttcaggatgg tgtcactcgt gacatcattt ctactgatga 420
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 caaaaatgac aaaagctgcc 500

<210> 105
 <211> 537
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 105
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<210> 106
<211> 427
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 106
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atactac 427

<210> 107
<211> 537
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 107
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<210> 108
<211> 551

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<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 108

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<210> 109

<211> 593

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 109

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caggcaaagt tgaagggtgc atgggtacaag taacctgtgg aactacaact cttaatggat      180
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tgagacctaa tcataccatt aaagggttct tccttaatgg atcatgtggg agtggtgggt      540
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<210> 110

<211> 504

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 110

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<210> 111
 <211> 298
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 111	
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<210> 112
 <211> 530
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 112	
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<210> 113
 <211> 605
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 113	
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aattc	605

<210> 114
 <211> 176
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 114	
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<210> 115
 <211> 516
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 115	
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<210> 116
 <211> 366
 <212> DNA

<213> Severe acute respiratory syndrome virus

<400> 116

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tgataggtgt atccttcatt gtgcaaactg taatgtgtta ttttctgctg tgtttccacg    180
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<210> 117

<211> 291

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 117

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ggatgaggaa ggcaatttat tagactctta ctttgtagtt aagaggcata ctatgtctaa    120
ctaccaacat gaagagacta tttataactt gggttaaagat tgtccagcgg ttgctgtcca    180
tgactttttc aagtttagag tagatggtga catggtacca catatatcac gtcagcgtct    240
aactaaatac acaatggctg atttagtcta tgctctacgt cattttgatg a            291
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<210> 118

<211> 480

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 118

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gagtcccata tggatgctga tctcgcaaaa ccacttatta agtgggattt gctgaaatat    60
gattttacgg aagagagact ttgtctcttc gaccgttatt tttaaatttg ggaccagaca    120
taccatccca attgtattaa ctgtttggat gataggtgta tccttcattg tgcaaacttt    180
aatgtgttat tttctactgt gtttccacct acaagttttg gaccactagt aagaaaaata    240
tttgtagatg gtgttccttt tgttgtttca actggatacc attttcgtga gttaggagtc    300
gtacataatc aggatgtaaa cttacatagc tcgcgtctca gtttcaagga acttttagtg    360
tatgctgctg atccagctat gcatgcagct tctggcaatt tattgctaga taaacgcact    420
acatgctttt cagtagctgc actaacaac aatgttgctt ttcaaactgt caaacccggt    480
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<210> 119

<211> 405

<212> DNA

<213> Severe acute respiratory syndrome virus

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<400> 119
aatgggaact ggtacgattt cggtgatttc gtacaagtag caccaggctg cggagttcct    60
attgtggatt catattactc attgctgatg cccatcctca ctttgactag ggcattggct    120
gctgagtccc atatggatgc tgatctcgca aaaccactta ttaagtgaga ttgctgaaa    180
tatgatttta cggaagagag actttgtctc ttcgaccgtt attttaaata ttgggaccag    240
acataccatc ccaattgtat taactgtttg gatgataggt gtatccttca ttgtgcaaac    300
tttaatgtgt tattttctac tgtgtttcca cctacaagct ttggaccact agtaagaaaa    360
atatttgtag atggtgttcc ttttgttgtt tcaactggat accat                    405

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<210> 120
<211> 562
<212> DNA
<213> Severe acute respiratory syndrome virus

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<220>
<221> misc_feature
<222> (67)..(67)
<223> n is a, c, g, or t

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<400> 120
ctattgatgc ttaccactt acaaaacatc ctaatcagga gtatgctgat gtctttcact    60
tgtattnaca atacattaga aagttacatg atgagcttac tggccacatg ttggacatgt    120
attccgtaat gctaactaat gataacacct cacggtactg ggaacctgag ttttatgagg    180
ctatgtacac accacataca gtcttgcagg ctgtaggtgc ttgtgtattg tgcaattcac    240
agacttcact tcgttgcggt gcctgtatta ggagaccatt cctatgttgc aagtgctgct    300
atgaccatgt catttcaaca tcacacaaat tagtgttgtc tgtaaatccc tatgtttgca    360
atgccccagg ttgtgatgtc actgatgtga cacaactgta tctaggaggt atgagctatt    420
attgcaagtc acataagcct cccattagtt ttccattatg tgctaattgg cagggtttttg    480
gtttatacaa aaacacatgt gtaggcagtg acaatgtcac tgacttcaat gcgatagcaa    540
catgtgattg gactaatgct gg                                            562

```

```

<210> 121
<211> 580
<212> DNA
<213> Severe acute respiratory syndrome virus

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<400> 121
gctatgtaca caccacatac agtcttgcag gctgtaggtg cttgtgtatt gtgcaattca    60
cagacttcac ttcgttgcgg tgcctgtatt aggagaccat tcctatgttg caagtgctgc    120
tatgaccatg tcatttcaac atcacacaaa ttagtgttgt ctgttaatcc ctatgtttgc    180
aatgccccag gttgtgatgt cactgatgtg acacaactgt atctaggagg tatgagctat    240

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tattgcaagt cacataagcc tcccattagt tttccattat gtgctaattg tcagggttttt	300
ggttttatata aaaacacatg tgtaggcagt gacaatgtca ctgacttcaa tgcgatagca	360
acatgtgatt ggactaatgc tggcgattac atacttgcca acacttgtag tgagagactc	420
aagctttttcg cagcagaaac gctcaaagcc actgaggaaa catttaagct gtcatatggt	480
attgccactg tacgcgaagt actctctgac agagaattgc atctttcatg ggagggttga	540
aaacctagac caccattgaa cagaaactat gtctttactg	580

<210> 122
 <211> 610
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 122	
tggtgatgct gttgtgtaca gaggtactac gacatacaag ttgaatgttg gtgattactt	60
tgtgttgaca tctcacactg taatgccact tagtgcacct actctagtgc cacaagagca	120
ctatgtgaga attactggct tgtacccaac actcaacatc tcagatgagt tttctagcaa	180
tgttgcaaatt tatcaaaagg tcggcatgca aaagtactct acactccaag gaccacctgg	240
tactggtaag agtcattttg ccatcggact tgctctctat taccatctg ctgcgatagt	300
gtatacggca tgctctcatg cagctgttga tgccctatgt gaaaaggcat taaaatattt	360
gcccatagat aaatgtagta gaatcatacc tgcgcgtgcg cgcgtagagt gttttgataa	420
attcaaagtg aattcaacac tagaacagta tgttttctgc actgtaaatt cattgccaga	480
aacaactgct gacattgtag tctttgatga aatctctatg gctactaatt atgacttgag	540
tgttgtcaat gctagacttc gtgcaaaaca ctacgtctat attggcgatc ctgctcaatt	600
accagcccct	610

<210> 123
 <211> 429
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 123	
ccaacactca acatctcaga tgagtgttct agcaatgttg caaattatca aaaggctcggc	60
atgcaaaagt actctacact ccaaggacca cctggtagtg gtaagagtca ttttgccatc	120
ggacttgctc tctattacc atctgctcgc atagtgtata cggcatgctc tcatgcagct	180
gttgatgccc tatgtgaaaa ggcattaaaa tatttgccca tagataaatg tagtagaatc	240
atacctgcgc gtgcgcgcgt agagtgtttt gataaattca aagtgaattc aacactagaa	300
cagtatgttt tctgcactgt aaatgcattg ccagaaacaa ctgctgacat tgtagtcttt	360
gatgaaatct ctatggctac taattatgac ttgagtgttg tcaatgctag acttcgtgca	420
aaacactac	429

<210> 124
 <211> 486
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 124
 caatgtggct atcacaaggg caaaaattgg cattttgtgc ataatgtctg atagagatct 60
 ttatgacaaa ctgcaattta caagtctaga aataccacgt cgcaatgtgg ctacattaca 120
 agcagaaaat gtaactggac tttttaagga ctgtagtaag atcattactg gtcttcatcc 180
 tacacaggca cctacacacc tcagcgttga tataaagttc aagactgaag gattatgtgt 240
 tgacatacca ggcataccaa aggacatgac ctaccgtaga ctcattctcta tgatggggtt 300
 caaaatgaat taccaagtca atgggttacc taatatgttt atcaccgcg aagaagctat 360
 tcgtcacgtt cgtgcgtgga ttggctttga tgtagagggc tgtcatgcaa ctagagatgc 420
 tgtgggtact aacctacctc tccagctagg attttctaca ggtgttaact tagtagctgt 480
 accgac 486

<210> 125
 <211> 427
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 125
 aaaggacatg acctaccgta gactcatctc tatgatgggt ttcaaatga attaccaagt 60
 caatgggttac cctaatatgt ttatcacccg cgaagaagct attcgtcacg ttcgtgcgtg 120
 gattggcttt gatgtagagg gctgtcatgc aactagagat gctgtgggta ctaacctacc 180
 tctccagcta ggattttcta cagggtgttaa cttagtagct gtaccgactg gttatgttga 240
 cactgaaaat aacacagaat tcaccagagt taatgcaaaa cctccaccag gtgaccagtt 300
 taaacatctt ataccactca tgtataaagg cttgccctgg aatgtagtgc gtattaagat 360
 agtacaaatg ctcatgata cactgaaagg attgtcagac agagtcgtgt tcgtcctttg 420
 ggcgcat 427

<210> 126
 <211> 392
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 126
 atggaaatgc acatgtggct agttgtgatg ctatcatgac tagatgttta gcagtccatg 60
 agtgctttgt taagcgcgtt gattggctctg ttgaataccc tattatagga gatgaactga 120
 gggttaattc tgcttgcaga aaagtacaac acatggttgt gaagtctgca ttgcttgctg 180
 ataagtttcc agttcttcat gacattggaa atccaaaggc tatcaagtgt gtgcctcagg 240

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ctgaagtaga atggaagttc tacgatgctc agccatgtag tgacaaagct tacaaaatag 300
 aggaactctt ctattcttat gctacacatc acgataaatt cactgatggg gtttgtttgt 360
 tttggaattg taacgttgat cgttacccag cc 392

<210> 127
 <211> 483
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 127
 gcttcatcag atacttatgc ctgctggaat cattctgtgg gttttgacta tgtctataac 60
 ccatttatga ttgatgttca gcagtggggc ttacgggta accttcagag taaccatgac 120
 caacattgcc aggtacatgg aaatgcacat gtggctagtt gtgatgctat catgactaga 180
 tgtttagcag tccatgagtg ctttgtttaag cgcgttgatt ggtctgttga ataccctatt 240
 ataggagatg aactgagggt taattctgct tgcagaaaag tacaacacat ggttgtgaag 300
 tctgcattgc ttgctgataa gtttccagtt cttcatgaca ttggaaatcc aaaggctatc 360
 aagtgtgtgc ctcaggctga agtagaatgg aagttctacg atgctcagcc atgtagtgac 420
 aaagcttaca aaatagagga actcttctat tcttatgcta cacatcacga taaattcact 480
 gat 483

<210> 128
 <211> 326
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 128
 tcaaagggac cagcacaagc tagcgtcaat ggagtcacat taattggaga atcagtaaaa 60
 acacagttta actactttaa gaaagtagac ggcattattc aacagttgcc tgaaacctac 120
 ttactcaga gcagagactt agaggatttt aagcccagat cacaatgga aactgacttt 180
 ctcgagctcg ctatggatga attcatacag cgatataagc tcgagggcta tgccttcgaa 240
 cacatcgttt atggagattt cagtcatgga caacttggcg gtcttcattt aatgataggc 300
 ttagccaagc gtcacaaga ttcact 326

<210> 129
 <211> 457
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 129
 acaccttcaa agggaccagc acaagctagc gtcaatggag tcacattaat tggagaatca 60
 gtaaaaacac agtttaacta ctttaagaaa gtagacggca ttattcaaca gttgcctgaa 120
 acctacttta ctcagagcag agacttagag gattttaagc ccagatcaca aatggaaact 180

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gactttctcg agctcgctat ggatgaattc' atacagcgat ataagctcga gggctatgcc 240
 ttcgaacaca tcgtttatgg agatttcagt catggacaac ttggcgggtct tcattttaatg 300
 ataggcttag ccaagcgctc acaagattca ccacttaaata tagaggattt tatccctatg 360
 gacagcacag tgaaaaatta cttcataaca gatgcgcaaa caggttcac aaatgtgtg 420
 tgttctgtga ttgatctttt acttgatgac tttgtcg 457

<210> 130
 <211> 493
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 130
 cgcaaagtat actcaactgt gtcaatactt aaatacactt acttttagctg taccctacaa 60
 catgagagtt attcactttg gtgctggctc tgataaagga gttgcaccag gtacagctgt 120
 gctcagacaa tggttgcca ctggcacact acttgtcgat tcagatctta atgacttcgt 180
 ctccgacgca gattctactt taattggaga ctgtgcaaca gtacatacgg ctaataaatg 240
 ggaccttatt attagcgata tgtatgaccc taggaccaa catgtgacaa aagagaatga 300
 ctctaaagaa gggtttttca cttatctgtg tggatttata aagcaaaaac tagccctggg 360
 tggttctata gctgtaaaga taacagagca ttcttggaat gctgacctt acaagcttat 420
 gggccatttc tcatggtgga cagcttttgt tacaatgta aatgcatcat catcggaagc 480
 atttttaatt ggg 493

<210> 131
 <211> 490
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 131
 acttaaatac acttacttta gctgtaccct acaacatgag agttattcac tttggtgctg 60
 gctctgataa aggagttgca ccaggtagag ctgtgctcag acaatgggtg ccaactggca 120
 cactacttgt cgattcagat cttaatgact tcgtctccga cgcagattct actttaattg 180
 gagactgtgc aacagtagat acggctaata aatgggacct tattattagc gatatgtatg 240
 accctaggac caaacatgtg acaaaagaga atgactctaa agaagggtt ttcacttatc 300
 tgtgtggatt tataaagcaa aaactagccc tgggtgggtt tatagctgta aagataacag 360
 agcattcttg gaatgctgac ctttacaagc ttatgggcca tttctcatgg tggacagctt 420
 ttgttacaaa tgtaaagca tcatcatcgg aagcattttt aattggggct aactatcttg 480
 gcaagccgaa 490

<210> 132

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<211> 550
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 132
 taaggagaat caaatcaatg atatgattta ttctcttctg gaaaaaggta ggcttatcat 60
 tagagaaaac aacagagttg tggtttcaag tgatattctt gttaacaact aaacgaacat 120
 gtttattttc ttattatttc ttactctcac tagtggtagt gaccttgacc ggtgcaccac 180
 ttttgatgat gttcaagctc ctaattacac tcaacatact tcatctatga ggggggttta 240
 ctatcctgat gaaattttta gatcagacac tctttattta actcaggatt tatttcttcc 300
 attttattct aatgttacag ggtttcatac tattaatcat acgtttggca accctgtcat 360
 accttttaag gatggtatth attttgctgc cacagagaaa tcaaagtgtg tccgtggtg 420
 ggtttttggt tctaccatga acaacaagtc acagtcggtg attattatta acaattctac 480
 taatgttggt atacgagcat gtaactttga attgtgtgac aaccctttct ttgctgtttc 540
 taaaccata 550

<210> 133
 <211> 490
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 133
 acttaaatac acttacttta gctgtaccct acaacatgag agttattcac tttggtgctg 60
 gctctgataa aggagttgca ccaggtagag ctgtgctcag acaatgggtg ccaactggca 120
 cactacttgt cgattcagat cttaatgact tcgtctccga cgcagattct actttaattg 180
 gagactgtgc aacagtagat acggctaata aatgggacct tattattagc gatatgtatg 240
 accctaggac caaacatgtg acaaaagaga atgactctaa agaagggttt ttcacttatc 300
 tgtgtggatt tataaagcaa aaactagccc tgggtggttc tatagctgta aagataacag 360
 agcattcttg gaatgctgac ctttacaagc ttatgggcca tttctcatgg tggacagctt 420
 ttgttacaaa tgtaaagca tcatcatcgg aagcattttt aattggggct aactatcttg 480
 gcaagccgaa 490

<210> 134
 <211> 550
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 134
 taaggagaat caaatcaatg atatgattta ttctcttctg gaaaaaggta ggcttatcat 60
 tagagaaaac aacagagttg tggtttcaag tgatattctt gttaacaact aaacgaacat 120
 gtttattttc ttattatttc ttactctcac tagtggtagt gaccttgacc ggtgcaccac 180

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ttttgatgat gttcaagctc ctaattacac tcaacatact tcatctatga ggggggttta 240
 ctatcctgat gaaattttta gatcagacac tctttattta actcaggatt tatttcttcc 300
 attttattct aatgttacag ggtttcatac tattaatcat acgtttggca accctgtcat 360
 accttttaag gatggtatct attttgctgc cacagagaaa tcaaagtgtg tccgtgggtg 420
 ggtttttggt tctacatga acaacaagtc acagtcggtg attattatta acaattctac 480
 taatgttggt atacgagcat gtaactttga attgtgtgac aaccctttct ttgctgtttc 540
 taaaccata 550

<210> 135
 <211> 400
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 135
 atcaatgata tgatttattc tcttctggaa aaaggtaggc ttatcattag agaaaacaac 60
 agagttgtgg tttcaagtga tattcttggt aacaactaaa cgaacatgtt tattttctta 120
 ttatttctta ctctcactag tggtagtgc cttgaccggt gcaccacttt tgatgatgtt 180
 caagctccta attacactca acatacttca tctatgaggg gggtttacta tcctgatgaa 240
 atttttagat cagacactct ttatttaact caggatttat ttcttccatt ttattctaatt 300
 gttacagggt ttcatactat taatcatacg ttggcaacc ctgtcatacc ttttaaggat 360
 ggtatttatt ttgctgccac agagaaatca aatgttgtcc 400

<210> 136
 <211> 288
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 136
 tgatctttgc ttctccaatg tctatgcaga ttctttggta gtcaagggag atgatgtaag 60
 acaaatagcg ccaggacaaa ctggtgttat tgctgattat aattataaat tgccagatga 120
 tttcatgggt tgtgtccttg cttggaatac taggaacatt gatgctactt caactggtaa 180
 ttataattat aaatataggt atcttagaca tggcaagctt aggccctttg agagagacat 240
 atctaattg cctttctcca cctgatggca aaccttgac cccacctg 288

<210> 137
 <211> 411
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 137
 ctttgagaga gacatatcta atgtgccttt ctcccctgat ggcaaaccct gcaccccacc 60
 tgctcttaatt tgttattggc cattaaatga ttatgggttt tacaccacta ctggcattgg 120

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ctaccaacct tacagagttg tagtactttc ttttgaactt ttaaattgcac cggccacggt 180
 ttgtggacca aaattatcca ctgaccttat taagaaccag tgtgtcaatt ttaattttta 240
 tggactcact ggtactgggtg tgttaaactcc ttcttcaaag agatttcaac catttcaaca 300
 aattttgccg tgatgtttct gatttctactg attccgttcg agatcctaaa acatctgaaa 360
 tattagacat ttcaccctgc gcttttgggg gtgtaagtgt aattacacct g 411

<210> 138
 <211> 357
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 138
 tggaaatatt ttggtggttt taatttttca caaatattac ctgaccctct aaagccaact 60
 aagaggtctt ttattgagga cttgctcttt aataagggtga cactcgctga tgctggcttc 120
 atgaagcaat atggcgaatg cctaggtgat attaattgcta gagatctcat ttgtgcgcag 180
 aagttcaatg gacttacagt gttgccacct ctgctcactg atgatatgat tgctgcctac 240
 actgctgctc tagttagtgg tactgccact gctggatgga catttggtgc tggcgctgct 300
 cttcaaatac cttttgctat gcaaattggca tataggttca atggcattgg agttact 357

<210> 139
 <211> 434
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 139
 caatatggcg aatgcctagg tgatattaat gctagagatc tcattttgtgc gcagaagttc 60
 aatggactta cagtgttgcc acctctgctc actgatgata tgattgctgc ctacactgct 120
 gctctagtta gtggtactgc cactgctgga tggacatttg gtgctggcgc tgctcttcaa 180
 ataccttttg ctatgcaaatt ggcatatagg ttcaatggca ttggagttac ccaaaatggt 240
 ctctatgaga accaaaaaca aatcgccaac caatttaaca aggcgattag tcaaattcaa 300
 gaatcactta caacaacatc aactgcattg ggcaagctgc aagacgttgt taaccagaat 360
 gctcaagcat taaacacact tgttaaacaa cttagctcta attttggtgc aatttcaagt 420
 gtgctaaatg atat 434

<210> 140
 <211> 557
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 140
 acagacaata catttgtctc aggaaattgt gatgtcgta ttggcatcat taacaacaca 60
 gtttatgatc ctctgcaacc tgagcttgac tcattcaaag aagagctgga caagtacttc 120

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aaaaatcata catcaccaga tggtgatctt ggcgacattt caggcattaa cgcttctgtc	180
gtcaacattc aaaaagaaat tgaccgcctc aatgaggtcg ctaaaaattt aaatgaatca	240
ctcattgacc ttcaagaatt gggaaaatat gagcaatata ttaaattggcc ttggtatggt	300
tggctcggct tcattgctgg actaattgcc atcgtcatgg ttacaatctt gctttgttgc	360
atgactagtt gttgcagttg cctcaagggt gcatgctctt gtggttcttg ctgcaagttt	420
gatgaggatg actctgagcc agttctcaag ggtgtcaaata tacattacac ataaacgaac	480
ttatggattt gtttatgaga ttttttactc ttagatcaat tactgcacag ccagtaaaaa	540
ttgacaatgc ttctcct	557

<210> 141
 <211> 530
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 141	
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gttgcattgac tagttgttgc agttgcctca aggggtcatg ctcttggtgt tcttgctgca	120
agtttgatga ggatgactct gagccagttc tcaagggtgt caaattacat tacacataaa	180
cgaacttatg gatttgttta tgagattttt tactcttaga tcaattactg cacagccagt	240
aaaattgac aatgcttctc ctgcaagtac tgttcatgct acagcaacga taccgctaca	300
agcctcactc cctttcggat ggcttggtat tggcgttgca tttcttgctg tttttcagag	360
cgctaccaaa ataattgcgc tcaataaaaag atggcagcta gccctttata agggcttcca	420
gttcatttgc aatttactgc tgctatttgt taccatctat tcacatcttt tgcttgctgc	480
tgcaggtatg gaggcgcaat ttttgtagct ctatgccttg atatattttc	530

<210> 142
 <211> 320
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 142	
ttgctcgtac ccgctcaatg tggtcattca acccagaaac aaacattctt ctcaatgtgc	60
ctctccgggg gacaattgtg accagaccgc tcatggaaag tgaacttgct attggtgctg	120
tgatcattcg tggtcacttg cgaatggccg gacactccct agggcgctgt gacattaagg	180
acctgccaaa agagatcact gtggctacat cacgaacgct ttcttattac aaattaggag	240
cgtcgcagcg tgtaggcact gattcaggtt ttgctgcata caaccgctac cgtattggaa	300
actataaatt aaatacagac	320

<210> 143
 <211> 417

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<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 143

cgaacttatg tactcattcg tttcggaaga aacaggtagc ttaatagtta atagcgtagt	60
tcttttttctt gcttttcgtgg tattcttgct agtcacacta gccatcctta ctgcgcttcg	120
attgtgtgcg tactgctgca atattgttaa cgtgagttta gtaaaaccaa cgggtttacgt	180
ctactcgcgt gttaaaaatc tgaactcttc tgaaggagtt cctgatcttc tgggtctaaac	240
gaactaacta ttattattat tctgtttgga actttaacat tgcttatcat ggcagacaac	300
ggtactatta ccgttgagga gcttaaacaa ctcttggaac aatggaacct agtaataggt	360
ttcctattcc tagcctggat tatgttacta caatttgcct attctaatacg gaacagg	417

<210> 144

<211> 516

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 144

cttgatcattg gtgctgtgat cattcgtggt cacttgcgaa tggccggaca ctccctaggg	60
cgctgtgaca ttaaggacct gccaaaagag atcactgtgg ctacatcacg aacgctttct	120
tattacaaat taggagcgtc gcagcgtgta ggactgatt caggttttgc tgcatacaac	180
cgctaccgta ttggaaacta taaattaaat acagaccacg ccggtagcaa cgacaatatt	240
gctttgctag tacagtaagt gacaacagat gtttcatctt gttgacttcc aggttacaat	300
agcagagata ttgattatca ttatgaggac tttcaggatt gctatttgga atcttgacgt	360
tataataagt tcaatagtga gacaattatt taagcctcta actaagaaga attattcgga	420
gtagatgat gaagaacctt tggagttaga ttatccataa aacgaacatg aaaattattc	480
tcttcctgac attgatttta tttacatctt gcgagc	516

<210> 145

<211> 310

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 145

cgatgtttca tcttggtgac ttccagggtta caatagcaga gatattgatt atcattatga	60
ggactttcag gattgctatt tggaatcttg acgttataat aagttcaata gtgagacaat	120
tatttaagcc tctaactaag aagaattatt cggagttaga tgatgaagaa cctatggagt	180
tagattatcc ataaaacgaa catgaaaatt attctcttcc tgacattgat tgtatttaca	240
tcttgcgagc tatatcacta tcaggagtggt gtagagggtta cgactgtact actaaaagaa	300
ccttgcccat	310

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<210> 146
 <211> 556
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 146
 agaaagacag aatgaatgag ctcactttaa ttgacttcta tttgtgcttt ttagcctttc 60
 tgctattcct tgttttaata atgcttatta tattttgggt ttcactcgaa atccaggatc 120
 tagaagaacc ttgtaccaa gtctaaacga acatgaaact tctcattggt ttgacttgta 180
 tttctctatg cagttgcata tgcactgtag tacagcgctg tgcattctaat aaacctcatg 240
 tgcttgaaga tccttgtaag gtacaacact aggggtaata cttatagcac tgcttggctt 300
 tgtgctctag gaaagggttt accctttcat agatggcaca ctatgggttca aacatgcaca 360
 cctaattgta ctatcaactg tcaagatcca gctgggtggtg cgcttatagc taggtggttg 420
 taccttcatg aaggtcacca aactgctgca tttagagacg tacttggtgt tttaaataaa 480
 cgaacaaatt aaaatgtctg ataatggacc ccaatcaaac caacgtagtg cccccgcat 540
 tacatttggt ggaccc 556

<210> 147
 <211> 110
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 147
 acgaacatga aaattattct cttcctgaca ttgattgtat ttacatcttg cgagctatat 60
 cactatcagg agtggtgtag aggtacgact gtactactaa aagaaccttg 110

<210> 148
 <211> 363
 <212> DNA
 <213> Severe acute respiratory syndrome virus

<400> 148
 gcatttagag acgtacttgt tgttttaaat aaacgaacaa attaaaatgt ctgataatgg 60
 acctcaatca agccaacgta gtgcccccg cattacattt ggtggacca cagattcaac 120
 tgacaataac cagaatggag gacgcaatgg ggcaaggcca aaacagcgcc gacccaagg 180
 ttacccaat aatactgcgt cttggttcac agctctcact cagcatggca aggaggaact 240
 tagattccct cgaggccagg gcgttccaat caacaccaat agtgggtccag atgaccaa 300
 tggctactac cgaagagcta cccgacgagt tcgtggtggt gacggcaaaa tgaaagagct 360
 cag 363

<210> 149
 <211> 294
 <212> DNA
 <213> Severe acute respiratory syndrome virus

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<400> 149
ctatcagctg cgtgcaagat cagtttcacc aaaacttttc atcagacaag aggaggttca 60
acaagagctc tactcgccac tttttctcat tgttgctgct ctagtatttt taatactttg 120
cttcaccatt aagagaaaga cagaatgaat gagctcactt taattgactt ctatttgtgc 180
tttttagcct ttctgctatt ccttgtttta ataatgctta ttatatatttg gttttcactc 240
gaaatccagg atctagaaaa accttgtagc aaaggctaaa cgaacatgaa actt 294

<210> 150
<211> 504
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 150
caaactgctg catttagaga cgtacttggt gtttaaataa acgaacaaat taaaatgtct 60
gataatggac cccaatcaaa ccaacgtagt gcccccgca ttacatttgg tggacccaca 120
gattcaactg acaataacca gaatggagga cgcaatgggg caaggccaaa acagcgccga 180
ccccaagggt taccataa tactgctgt tggttcacag ctctcactca gcatggcaag 240
gaggaactta gattccctcg aggccagggc gttccaatca acaccaatag tgggtccagat 300
gaccaaattg gctactaccg aagagctacc cgacgagttc gtggtggtga cggcaaaatg 360
aaagagctca gccccagatg gtacttctat tacctaggaa ctggcccaga agcttcactt 420
ccctacggcg ctaacaaaga aggcacgta tgggttgcaa ctgagggagc cttgaatata 480
cccaaagacc acattggcac ccgt 504

<210> 151
<211> 474
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 151
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gagaaagaca gaatgaatga gctcacttta attgacttct atttgctgct tttagccttt 120
ctgctattcc ttgttttaaat aatgcttatt atattttggt tttcactcga aatccaggat 180
ctagaagaac cttgtaccaa agtctaaacg aacatgaaac ttctcattgt tttgacttgt 240
atttctctat gcagttgcat atgcactgta gtacagcgct gtgcatctaa taaacctcat 300
gtgcttgaag atccttgtaa ggtacaacac taggggtaat acttatagca ctgcttggct 360
ttgtgctcta ggaaagggtt taccttttca tagatggcac actatgggtc aaacatgcac 420
acctaattgt actatcaact gtcaagatcc agctgggtggt gcgcttatag ctag 474

<210> 152
<211> 516

82936-7_seq_28_apr_2004_v1.ST25

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 152

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cattaagaga aagacagaat gaatgagctc actttaattg acttctatct gtgcttttta      60
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caggatctag aagaaccttg taccaaagtc taaacgaaca tgaaacttct cattgttttg      180
acttgtatct ctctatgcag ttgcatatgc actgtagtac agcgctgtgc atctaataaa      240
cctcatgtgc ttgaagatcc ttgtaaggta caacactagg ggtaatactt atagcactgc      300
ttggctttgt gctctaggaa aggttttacc ttttcataga tggcacacta tggttcaaac      360
atgcacacct aatgttacta tcaactgtca agatccagct ggtgggtgcgc ttatagctag      420
gtgttggtac cttcatgaag gtcaccaaac tgctgcattt agagacgtac ttgttgtttt      480
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<210> 153

<211> 451

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 153

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ccaaattggc tactaccgaa gagctacccg acgagttcgt ggtgggtgacg gcaaaatgaa      180
agagctcagc cccagatggg acttctatta cctaggaact ggcccagaag cttcacttcc      240
ctacggcgct acaaagaag gcatcgatg gggtgcaact gagggagcct tgaatacacc      300
caaagaccac attggcaccg gcaatcctaa taacaatgct gccaccgtgc tacaacttcc      360
tcaaggaaca acattgccaa aaggcttcta cgagagggga agcagaggcg gcagtcaagc      420
ctcttctcgc tcctcatcac gtagtcgcgg t                                451

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<210> 154

<211> 495

<212> DNA

<213> Severe acute respiratory syndrome virus

<400> 154

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gatgaagctc agcctttgcc gcagagacaa aagaagcagc ccactgtgac tcttcttcct      60
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gattcaactc aggcataaac actcatgatg accacacaag gcagatgggc tatgtaaagc      180
ttttcgcaat tccgtttacg atacatagtc tactcttgtg cagaatgaat tctcgtaact      240
aaacagcaca agtaggttta gttaacttta atctcacata gcaatcttta atcaatgtgt      300
aacattaggg aggacttgaa agagccacca cattttcatc gaggccacgc ggagtagcat      360

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cgagggtaca gtgaataatg ctagggagag ctgcctatat ggaagagccc taatgtgtaa 420
aattaatttt agtagtgcta tccccatgtg attttaatag cttcttagga gaatgacaaa 480
aaaaaaaaaa aaaaa 495

<210> 155
<211> 512
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 155
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acgtactgcc acaaaacagt acaacgtcac tcaagcattt gggagacgtg gtccagaaca 120
aaccaagga aatttcgggg accaagacct aatcagacaa ggaactgatt acaaacattg 180
gccgcaaatt gcacaatttg ctccaagtgc ctctgcattc tttggaatgt cacgcattgg 240
catggaagtc acaccttcgg gaacatggct gacttatcat ggagccatta aattggatga 300
caaagatcca caattcaaag acaacgtcat actgctgaac aagcacattg acgcatacaa 360
aacattccca ccaacagagc ctaaaaagga caaaaagaaa aagactgatg aagctcagcc 420
tttgccgcag agacaaaaga agcagcccac tgtgactctt cttcctgcgg ctgatatgga 480
tgatttctcc agacaacttc aaaattccat ga 512

<210> 156
<211> 442
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 156
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agtggagctt ctgctgattc aactcaggca taaacactca tgatgaccac acaaggcaga 120
tgggctatgt aaacgttttc gcaattccgt ttacgataca tagtctactc ttgtgcagaa 180
tgaattctcg taactaaaca gcacaagtag gtttagttaa ctttaatctc acatagcaat 240
ctttaatcaa tgtgtaacat tagggaggac ttgaaagagc caccacattt tcatcgaggc 300
cacgcggagt acgatcgagg gtacagtga taatgctagg gagagctgcc tatatggaag 360
agccctaatz tgtaaaatta attttagtag tgctatcccc atgtgatttt aatagcttct 420
taggagaatz acaaaaaaaaa aa 442

<210> 157
<211> 24
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<213> Artificial Sequence

<220>
<223> Primer

<400> 157
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24

<210> 158
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 158
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20

<210> 159
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 159
ctgtagaaaa tcctagctgg ag

22

<210> 160
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 160
cataaccagt cggtacagct a

21

<210> 161
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 161
ttatcacccg cgaagaagct

20

<210> 162
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 162
ctctagttgc atgacagccc tc

22

<210> 163
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 163
 tcgtgcgtgg attggctttg atgt

24

<210> 164
 <211> 24
 <212> DNA
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<220>
 <223> Primer

<400> 164
 gggttgggac taccctaagt gtga

24

<210> 165
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 165
 taacacacaa acaccatcat ca

22

<210> 166
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 166
 gggtgggact atcctaagtg tga

23

<210> 167
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 167
 ccatcatcag atagaatcat cata

24

<210> 168

<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 168
cctctcttgt tcttgctcgc a

21

<210> 169
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 169
tatagtgagc cgccacacat g

21

<210> 170
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<220>
<221> misc_feature
<222> (12)..(12)
<223> n is a, c, g, or t

<400> 170
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21

<210> 171
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 171
ctaacatgct taggataatg g

21

<210> 172
<211> 21
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<220>
<223> Primer

<400> 172
gcctctcttg ttcttgctcg c

21

<210> 173
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 173
caggtaaagcg taaaactcat c

21

<210> 174
<211> 17
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<220>
<223> Primer

<400> 174
tacacacctc agcgttg

17

<210> 175
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 175
cacgaacgtg acgaat

16

<210> 176
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 176
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20

<210> 177
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 177
caggaaacag ctatgacttg catcaccact agttgtgccca ccaggtt

47

<210> 178

<211> 46
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 178
 tgtaaaacga cggccagttg atgggatggg actatcctaa gtgtga

46

<210> 179
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 179
 gcataggcag tagttgcatc

20

<210> 180
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> ATP Binding Domain

<220>
 <221> MISC_FEATURE
 <222> (1)..(1)
 <223> Xaa = A or G

<220>
 <221> misc_feature
 <222> (2)..(5)
 <223> Xaa can be any naturally occurring amino acid

<220>
 <221> MISC_FEATURE
 <222> (8)..(8)
 <223> Xaa = S or T

<400> 180
 Xaa Xaa Xaa Xaa Xaa Gly Lys Xaa
 1 5

<210> 181
 <211> 23
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 181
 Trp Tyr Val Trp Leu Gly Phe Ile Ala Gly Leu Ile Ala Ile Val Met
 1 5 10 15

Val Thr Ile Leu Leu Cys Cys
20

<210> 182
<211> 16
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 182

Met Asp Leu Phe Met Arg Phe Phe Thr Leu Arg Ser Ile Thr Ala Gln
1 5 10 15

<210> 183
<211> 150
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 183

Met Arg Cys Trp Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu
1 5 10 15

Tyr Asp Ala Asn Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr
20 25 30

Cys Ile Pro Tyr Asn Ser Val Thr Asp Thr Ile Val Val Thr Glu Gly
35 40 45

Asp Gly Ile Ser Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly
50 55 60

Tyr Ser Glu Asp Arg His Ser Gly Val Lys Asp Tyr Val Val Val His
65 70 75 80

Gly Tyr Phe Thr Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr
85 90 95

Thr Asp Thr Gly Ile Glu Asn Ala Thr Phe Phe Ile Phe Asn Lys Leu
100 105 110

Val Lys Asp Pro Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser
115 120 125

Gly Val Ala Asn Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr
130 135 140

Thr Thr Ser Val Pro Leu
145 150

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<210> 184
 <211> 20
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 184

Met Met Pro Thr Thr Leu Phe Ala Gly Thr His Ile Thr Met Thr Thr
 1 5 10 15

Val Tyr His Ile
 20

<210> 185
 <211> 42
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 185

Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn Val Ser
 1 5 10 15

Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn Leu Asn
 20 25 30

Ser Ser Glu Gly Val Pro Asp Leu Leu Val
 35 40

<210> 186
 <211> 39
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 186

Met Ala Asp Asn Gly Thr Ile Thr Val Glu Glu Leu Lys Gln Leu Leu
 1 5 10 15

Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp Ile Met
 20 25 30

Leu Leu Gln Phe Ala Tyr Ser
 35

<210> 187
 <211> 100
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 187

Pro Leu Arg Gly Thr Ile Val Thr Arg Pro Leu Met Glu Ser Glu Leu
 1 5 10 15

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Val Ile Gly Ala Val Ile Ile Arg Gly His Leu Arg Met Ala Gly His
20 25 30

Ser Leu Gly Arg Cys Asp Ile Lys Asp Leu Pro Lys Glu Ile Thr Val
35 40 45

Ala Thr Ser Arg Thr Leu Ser Tyr Tyr Lys Leu Gly Ala Ser Gln Arg
50 55 60

Val Gly Thr Asp Ser Gly Phe Ala Ala Tyr Asn Arg Tyr Arg Ile Gly
65 70 75 80

Asn Tyr Lys Leu Asn Thr Asp His Ala Gly Ser Asn Asp Asn Ile Ala
85 90 95

Leu Leu Val Gln
100

<210> 188
<211> 23
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 188

Phe Tyr Leu Cys Phe Leu Ala Phe Leu Leu Phe Leu Val Leu Ile Met
1 5 10 15

Leu Ile Ile Phe Trp Phe Ser
20

<210> 189
<211> 19
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 189

Leu Leu Ile Val Leu Thr Cys Ile Ser Leu Cys Ser Cys Ile Cys Thr
1 5 10 15

Val Val Gln

<210> 190
<211> 24
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 190

Ile Cys Thr Val Val Gln Arg Cys Ala Ser Asn Lys Pro His Val Leu
Page 210

1

5

Glu Asp Pro Cys Lys Val Gln His
20

<210> 191
<211> 22
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 191

Cys Ile Cys Thr Val Val Gln Arg Cys Ala Ser Asn Lys Pro His Val
1 5 10 15

Leu Glu Asp Pro Cys Lys
20

<210> 192
<211> 22
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 192

Val Val Ala Val Ile Gln Glu Ile Gln Leu Leu Ala Ala Val Gly Glu
1 5 10 15

Ile Leu Leu Leu Glu Trp
20

<210> 193
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Linker

<400> 193
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19

<210> 194
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Linker

<400> 194
gtcgacgcgg ccgcg

15

<210> 195
<211> 19

<212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 195
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19

<210> 196
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 196
 ggcctcttcg ctattacgc

19

<210> 197
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 197
 tgcaggtcga ctctagagga t

21

<210> 198
 <211> 410
 <212> PRT
 <213> Avian infectious bronchitis virus

<400> 198

Met Ala Ser Gly Lys Ala Ala Gly Lys Thr Asp Ala Pro Ala Pro Val
 1 5 10 15

Ile Lys Leu Gly Gly Pro Lys Pro Pro Lys Val Gly Ser Ser Gly Asn
 20 25 30

Ala Ser Trp Phe Gln Ala Ile Lys Ala Lys Lys Leu Asn Thr Pro Pro
 35 40 45

Pro Lys Phe Glu Gly Ser Gly Val Pro Asp Asn Glu Asn Ile Lys Pro
 50 55 60

Ser Gln Gln His Gly Tyr Trp Arg Arg Gln Ala Arg Phe Lys Pro Gly
 65 70 75 80

Lys Gly Gly Arg Lys Pro Val Pro Asp Ala Trp Tyr Phe Tyr Tyr Thr
 85 90 95

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Gly Thr Gly Pro Ala Ala Asp Leu Asn Trp Gly Asp Thr Gln Asp Gly
100 105 110

Ile Val Trp Val Ala Ala Lys Gly Ala Asp Thr Lys Ser Arg Ser Asn
115 120 125

Gln Gly Thr Arg Asp Pro Asp Lys Phe Asp Gln Tyr Pro Leu Arg Phe
130 135 140

Ser Asp Gly Gly Pro Asp Gly Asn Phe Arg Trp Asp Phe Ile Pro Leu
145 150 155 160

Lys Asn Arg Gly Arg Ser Gly Arg Ser Thr Ala Ala Ser Ser Ala Ala
165 170 175

Ala Ser Arg Ala Pro Ser Arg Glu Gly Ser Arg Gly Arg Arg Ser Asp
180 185 190

Ser Gly Asp Asp Leu Ile Ala Arg Ala Ala Lys Ile Ile Gln Asp Gln
195 200 205

Gln Lys Lys Gly Ser Arg Ile Thr Lys Ala Lys Ala Asp Glu Met Ala
210 215 220

His Arg Arg Tyr Cys Lys Arg Thr Ile Pro Pro Asn Tyr Arg Val Asp
225 230 235 240

Gln Val Phe Gly Pro Arg Thr Lys Gly Lys Glu Gly Asn Phe Gly Asp
245 250 255

Asp Lys Met Asn Glu Glu Gly Ile Lys Asp Gly Arg Val Thr Ala Met
260 265 270

Leu Asn Leu Val Pro Ser Ser His Ala Cys Leu Phe Gly Ser Arg Val
275 280 285

Thr Pro Lys Leu Gln Leu Asp Gly Leu His Leu Arg Phe Glu Phe Thr
290 295 300

Thr Val Val Pro Cys Asp Asp Pro Gln Phe Asp Asn Tyr Val Lys Ile
305 310 315 320

Cys Asp Gln Cys Val Asp Gly Val Gly Thr Arg Pro Lys Asp Asp Glu
325 330 335

Pro Lys Pro Lys Ser Arg Ser Ser Ser Arg Pro Ala Thr Arg Gly Asn
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Ser Pro Ala Pro Arg Gln Gln Arg Pro Lys Lys Glu Lys Lys Leu Lys
355 360 365

Lys Gln Asp Asp Glu Ala Asp Lys Ala Leu Thr Ser Asp Glu Glu Arg
370 375 380

Asn Asn Ala Gln Leu Glu Phe Tyr Asp Glu Pro Lys Val Ile Asn Trp
385 390 395 400

Gly Asp Ala Ala Leu Gly Glu Asn Glu Leu
405 410

<210> 199
<211> 30
<212> PRT
<213> conotoxin

<400> 199

Cys Ile Ala Val Gly Gln Leu Cys Val Phe Trp Asn Ile Gly Arg Pro
1 5 10 15

Cys Cys Ser Gly Leu Cys Val Phe Ala Cys Thr Val Lys Leu
20 25 30

<210> 200
<211> 31
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 200

Cys Ile Ser Leu Cys Ser Cys Ile Cys Thr Val Val Gln Arg Cys Ala
1 5 10 15

Ser Asn Lys Pro His Val Leu Glu Asp Pro Cys Lys Val Gln His
20 25 30

<210> 201
<211> 310
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 201

cgatgtttca tcttggtgac ttccagggtta caatagcaga gatattgatt atcattatga 60
ggacttttcag gattgctatt tggaatcttg acgttataat aagttcaata gtgagacaat 120
tatttaagcc tctaactaag aagaattatt cggaggttaga tgatgaagaa cctatggagt 180
tagattatcc ataaaacgaa catgaaaatt attctcttcc tgacattgat tgtattttaca 240

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tcttgcgagc tatatcacta tcaggagtgt gttagaggta cgactgtact actaaaagaa 300
ccttgcccat 310

<210> 202
<211> 556
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 202
agaaagacag aatgaatgag ctcactttaa ttgacttcta tttgtgcttt ttagcctttc 60
tgctattcct tgttttaata atgcttatta tattttgggt ttcactcgaa atccaggatc 120
tagaagaacc ttgtaccaa gtctaaacga acatgaaact tctcattggt ttgacttgta 180
tttctctatg cagttgcata tgcactgtag tacagcgctg tgcattctaat aaacctcatg 240
tgcttgaaga tccttgtaag gtacaacact aggggtaata cttatagcac tgcttggctt 300
tgtgctctag gaaagggttt accttttcat agatggcaca ctatgggttca aacatgcaca 360
cctaattgta ctatcaactg tcaagatcca gctgggtggg cgcttatagc taggtgttgg 420
taccttcatg aaggtcacca aactgctgca tttagagacg tacttggtgt tttaaataaa 480
cgaacaaatt aaaatgtctg ataatggacc ccaatcaaac caacgtagtg ccccccgcac 540
tacatttggt ggaccc 556

<210> 203
<211> 1255
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 203

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly Ser Asp Leu
1 5 10 15

Asp Arg Cys Thr Thr Phe Asp Asp Val Gln Ala Pro Asn Tyr Thr Gln
20 25 30

His Thr Ser Ser Met Arg Gly Val Tyr Tyr Pro Asp Glu Ile Phe Arg
35 40 45

Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser
50 55 60

Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Gly Asn Pro Val
65 70 75 80

Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn
85 90 95

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val val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln
 100 105 110

Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Cys
 115 120 125

Asn Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met
 130 135 140

Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr
 145 150 155 160

Phe Glu Tyr Ile Ser Asp Ala Phe Ser Leu Asp Val Ser Glu Lys Ser
 165 170 175

Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly
 180 185 190

Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp
 195 200 205

Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu
 210 215 220

Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Ser Pro
 225 230 235 240

Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr
 245 250 255

Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile
 260 265 270

Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys
 275 280 285

Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn
 290 295 300

Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe Pro Asn Ile Thr
 305 310 315 320

Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser
 325 330 335

val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys val Ala Asp Tyr
 340 345 350

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Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly
355 360 365

Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala
370 375 380

Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly
385 390 395 400

Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe
405 410 415

Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser
420 425 430

Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu
435 440 445

Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly
450 455 460

Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp
465 470 475 480

Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln Pro Tyr Arg Val
485 490 495

Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val Cys Gly
500 505 510

Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys Val Asn Phe Asn
515 520 525

Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro Ser Ser Lys Arg
530 535 540

Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser Asp Phe Thr Asp
545 550 555 560

Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp Ile Ser Pro Cys
565 570 575

Ala Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala Ser Ser
580 585 590

Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val Ser Thr
595 600 605

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Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Ile Tyr Ser Thr
610 615 620

Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly Ala Glu
625 630 635 640

His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile Gly Ala Gly Ile
645 650 655

Cys Ala Ser Tyr His Thr Val Ser Leu Leu Arg Ser Thr Ser Gln Lys
660 665 670

Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Asp Ser Ser Ile Ala
675 680 685

Tyr Ser Asn Asn Thr Ile Ala Ile Pro Thr Asn Phe Ser Ile Ser Ile
690 695 700

Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr Ser Val Asp Cys
705 710 715 720

Asn Met Tyr Ile Cys Gly Asp Ser Thr Glu Cys Ala Asn Leu Leu Leu
725 730 735

Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Ser Gly Ile
740 745 750

Ala Ala Glu Gln Asp Arg Asn Thr Arg Glu Val Phe Ala Gln Val Lys
755 760 765

Gln Met Tyr Lys Thr Pro Thr Leu Lys Tyr Phe Gly Gly Phe Asn Phe
770 775 780

Ser Gln Ile Leu Pro Asp Pro Leu Lys Pro Thr Lys Arg Ser Phe Ile
785 790 795 800

Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly Phe Met
805 810 815

Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Asn Ala Arg Asp Leu Ile
820 825 830

Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro Leu Leu Thr
835 840 845

Asp Asp Met Ile Ala Ala Tyr Thr Ala Ala Leu Val Ser Gly Thr Ala
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850

855

860

Thr Ala Gly Trp Thr Phe Gly Ala Gly Ala Ala Leu Gln Ile Pro Phe
865 870 875 880

Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val Thr Gln Asn
885 890 895

Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala
900 905 910

Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly
915 920 925

Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu
930 935 940

Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn
945 950 955 960

Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val Gln Ile Asp
965 970 975

Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr Tyr Val Thr Gln
980 985 990

Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala Asn Leu Ala Ala
995 1000 1005

Thr Lys Met Ser Glu Cys Val Leu Gly Gln Ser Lys Arg Val Asp
1010 1015 1020

Phe Cys Gly Lys Gly Tyr His Leu Met Ser Phe Pro Gln Ala Ala
1025 1030 1035

Pro His Gly Val Val Phe Leu His Val Thr Tyr Val Pro Ser Gln
1040 1045 1050

Glu Arg Asn Phe Thr Thr Ala Pro Ala Ile Cys His Glu Gly Lys
1055 1060 1065

Ala Tyr Phe Pro Arg Glu Gly Val Phe Val Phe Asn Gly Thr Ser
1070 1075 1080

Trp Phe Ile Thr Gln Arg Asn Phe Phe Ser Pro Gln Ile Ile Thr
1085 1090 1095

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Thr Asp Asn Thr Phe Val Ser Gly Asn Cys Asp Val Val Ile Gly
 1100 1105 1110

Ile Ile Asn Asn Thr Val Tyr Asp Pro Leu Gln Pro Glu Leu Asp
 1115 1120 1125

Ser Phe Lys Glu Glu Leu Asp Lys Tyr Phe Lys Asn His Thr Ser
 1130 1135 1140

Pro Asp Val Asp Leu Gly Asp Ile Ser Gly Ile Asn Ala Ser Val
 1145 1150 1155

Val Asn Ile Gln Lys Glu Ile Asp Arg Leu Asn Glu Val Ala Lys
 1160 1165 1170

Asn Leu Asn Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly Lys Tyr
 1175 1180 1185

Glu Gln Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu Gly Phe Ile
 1190 1195 1200

Ala Gly Leu Ile Ala Ile Val Met Val Thr Ile Leu Leu Cys Cys
 1205 1210 1215

Met Thr Ser Cys Cys Ser Cys Leu Lys Gly Ala Cys Ser Cys Gly
 1220 1225 1230

Ser Cys Cys Lys Phe Asp Glu Asp Asp Ser Glu Pro Val Leu Lys
 1235 1240 1245

Gly Val Lys Leu His Tyr Thr
 1250 1255

<210> 204
 <211> 422
 <212> PRT
 <213> Severe acute respiratory syndrome virus

<400> 204

Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro Arg Ile
 1 5 10 15

Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn Gly Gly
 20 25 30

Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu Pro Asn
 35 40 45

Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu
 50 55 60

Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn Ser Gly
 65 70 75 80

Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg
 85 90 95

Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr Phe Tyr
 100 105 110

Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala Asn Lys
 115 120 125

Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr Pro Lys
 130 135 140

Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr Val Leu
 145 150 155 160

Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala Glu Gly
 165 170 175

Ser Arg Gly Gly Ser Gln Ala Ser Ser Arg Ser Ser Ser Arg Ser Arg
 180 185 190

Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn Ser Pro
 195 200 205

Ala Arg Met Ala Ser Gly Gly Gly Glu Thr Ala Leu Ala Leu Leu Leu
 210 215 220

Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln
 225 230 235 240

Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser
 245 250 255

Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr
 260 265 270

Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly
 275 280 285

Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln
 290 295 300

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Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg
305 310 315 320

Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly
325 330 335

Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile
340 345 350

Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu
355 360 365

Pro Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro
370 375 380

Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp
385 390 395 400

Met Asp Asp Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly Ala Ser
405 410 415

Ala Asp Ser Thr Gln Ala
420

<210> 205
<211> 221
<212> PRT
<213> Sars associated coronavirus

<400> 205

Met Ala Asp Asn Gly Thr Ile Thr Val Glu Glu Leu Lys Gln Leu Leu
1 5 10 15

Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp Ile Met
20 25 30

Leu Leu Gln Phe Ala Tyr Ser Asn Arg Asn Arg Phe Leu Tyr Ile Ile
35 40 45

Lys Leu Val Phe Leu Trp Leu Leu Trp Pro Val Thr Leu Ala Cys Phe
50 55 60

Val Leu Ala Ala Val Tyr Arg Ile Asn Trp Val Thr Gly Gly Ile Ala
65 70 75 80

Ile Ala Met Ala Cys Ile Val Gly Leu Met Trp Leu Ser Tyr Phe Val
85 90 95

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Ala Ser Phe Arg Leu Phe Ala Arg Thr Arg Ser Met Trp Ser Phe Asn
100 105 110

Pro Glu Thr Asn Ile Leu Leu Asn Val Pro Leu Arg Gly Thr Ile Val
115 120 125

Thr Arg Pro Leu Met Glu Ser Glu Leu Val Ile Gly Ala Val Ile Ile
130 135 140

Arg Gly His Leu Arg Met Ala Gly His Ser Leu Gly Arg Cys Asp Ile
145 150 155 160

Lys Asp Leu Pro Lys Glu Ile Thr Val Ala Thr Ser Arg Thr Leu Ser
165 170 175

Tyr Tyr Lys Leu Gly Ala Ser Gln Arg Val Gly Thr Asp Ser Gly Phe
180 185 190

Ala Ala Tyr Asn Arg Tyr Arg Ile Gly Asn Tyr Lys Leu Asn Thr Asp
195 200 205

His Ala Gly Ser Asn Asp Asn Ile Ala Leu Leu Val Gln
210 215 220

<210> 206
<211> 76
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 206

Met Tyr Ser Phe Val Ser Glu Glu Thr Gly Thr Leu Ile Val Asn Ser
1 5 10 15

Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
20 25 30

Ile Leu Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn
35 40 45

Val Ser Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn
50 55 60

Leu Asn Ser Ser Glu Gly Val Pro Asp Leu Leu Val
65 70 75